

a) NAME

Mitra, Sushanta K.

Professor, tenured

Member of the Graduate faculty

b) DEGREES

Ph.D., University of Waterloo, Mechanical Engineering, 2001

M.A.Sc., University of Victoria, Mechanical Engineering, 1997

Bachelor's, Jadavpur University, Kolkata, India, Mechanical Engineering, 1995

c) EMPLOYMENT HISTORY

2017-present: Professor, Mechanical and Mechatronics Engineering, University of Waterloo

2017-present: Executive Director, Waterloo Institute for Nanotechnology, University of Waterloo

2022-2024: Cross-appointed to Electrical and Computer Engineering, University of Waterloo

2017-2025: Cross-appointed to Physics & Astronomy, University of Waterloo

2018-2025: Cross-appointed to Chemical Engineering, University of Waterloo

2021-present: CEO, SLE Enterprises B.V.

2021-2024: Cross-appointed to Chemistry, University of Waterloo

2021-2024: Guest Professor, Shanghai Jiao Tong University

2019-2023: WPI Visiting Professor, International Institute for Carbon-Neutral Energy Research,
Kyushu University, Japan

2015-2017: Associate Vice-President Research, York University, Toronto

2014-2017: Kaneff Professor in Micro & Nanotechnology for Social Innovation, Mechanical
Engineering, York University

2014-2015: Chair, Mechanical Engineering, York University

2013-2014: Associate Scientific Director & Director IC-IMPACTS (NCE) of Training and Mobility,
IC-IMPACTS (NCE)

2012-2014: Professor, Mechanical Engineering, University of Alberta

2012-2014: Assistant Vice-President (Research), University of Alberta

2008-2012: Associate Professor, Mechanical Engineering, University of Alberta

2008-present: Director, Micro & Nano-scale Transport Lab, Canada

2008: Visiting Professor, Mechanical and Mechatronics Engineering, University of Waterloo

2007-2008: Associate Professor, Mechanical Engineering, ITT Bombay, India

2006: Visiting Professor, Mechanical and Mechatronics Engineering, University of Waterloo

2006: Guest Scientist, Modeling Group, NRC Institute of Fuel Cell and Innovation, Vancouver

2005: Visiting Professor, Mechanical and Mechatronics Engineering, University of Waterloo

2002-2007: Assistant Professor, Mechanical Engineering ITT Bombay, India

2001-2002: Nuclear Safety Analysis Division, Ontario Power Generation, Toronto

d) HONOURS

Foreign Fellow of the National Academy of Sciences India (NASI), 2021

President's Excellence in Teaching and Research, University of Waterloo, 2018, 2020

Prominent Researcher Award, ICNMM 2019 – American Society of Mechanical Engineers (ASME), 2019

Hind Rattan Award (Jewel of India), NRI Welfare Society of India, 2018

Foreign Fellow of the Indian National Academy of Engineering (INAE), 2017

Fellow of the American Physical Society (APS), 2017

Recipient of York University Research Leaders Award, 2015, 2016, 2017

Fellow of the American Association for the Advancement of Science (AAAS), 2015

Engineering Excellence Medal, Ontario Society of Professional Engineers (OSPE), 2015

Fellow of the Canadian Academy of Engineering (CAE), 2015

Fellow of the Royal Society of Chemistry (RSC), 2014

National Institute for Nanotechnology (NINT) Fellow, 2014

Fellow of the Engineering Institute of Canada (EIC), 2014

Japan Society for the Promotion of Science (JSPS) Invitation Fellow, 2014

Fellow of the Canadian Society for Mechanical Engineering (CSME), 2012

Fellow of the American Society of Mechanical Engineers (ASME), 2011

ASME ICNMM Outstanding Researcher Award, 2011

e) SCHOLARLY AND PROFESSIONAL ACTIVITIES

Executive

President, Canadian Society for Mechanical Engineering, 2016-2018; Past-President, 2018-2020
Board Member, Canadian Hydrogen and Fuel Cell Association (CHFCA), September 2021-August 2022.

Chair, Awards Committee, Canadian Society for Mechanical Engineering (CSME), 2018-2020

Member, Board of Directors, nanoOntario, October 2015-present

Member, Board of Directors, Shared Hierarchical Academic Research Computing Network (SHARCNet), August 2015-2017

Elected Board Member of Professional Engineers Ontario (PEO) Mississauga Chapter, 2015-2017.

Editorial

Editorial Board Member, Micromachines, 2019 – present.

Conference organization

Co-Chair, World Fuel Cell Conference, organized by Fuel Cell Division of the International Association for Hydrogen Energy, Waterloo, Canada, August 17 – 20, 2021.

Co-Organizer, “IMCS 07 Microfluidic Devices and Sensors”, 239th ECS Meeting and 18th International Meeting of Chemical Sensors (IMCS), Chicago, USA, May 30 – June 3, 2021.

Lead Organizer, “Microfabricated and Nanofabricated Systems for MEMS/NEMS”, PRiME 2020, Honolulu, Hawaii, October 4 – 9, 2020.

Symposium Co-Organizer, “M01 - Chemical Sensors 14: Chemical and Biological Sensors and Analytical Systems”, AiMES 2018 ECS and SMEQ Joint International Meeting, Cancun, Mexico, Sept. 30 – Oct. 4, 2018.

Symposium Co-organizer, "Sensors, Actuators and Microsystems General Session", 23rd Electrochemical Society (ECS) Meeting, National Harbor, October 1 - 6, 2017.
Co-Chair, Reconnect Canada 2017, Consortia Advancing Standards in Research Administration Information (CASRAI), Montreal, May 26 – 27, 2017.
Symposium Co-organizer, "Nano/Bio Sensors", 231st Electrochemical Society (ECS) Meeting, New Orleans, May 28 – June 2, 2017.

f) GRADUATE SUPERVISIONS

Completed: 11 P.D.F., 11 Ph.D., 34 M.A.Sc./M.Sc./M.Tech
In progress: 3 P.D.F., 3 Ph.D., 1 M.Sc.

NAME OF STUDENTS supervised (past seven years, no thesis titles given)

1. P. Kumar, Ph.D., 2015-2018
2. Das, Ph.D., 2016-2022
3. S. Hazra, Ph.D., 2018-2021
4. S. Misra, Ph.D., 2018-2023
5. A-Reum Kim, Ph.D., 2019-2023
6. H. Teshima, Ph.D., 2019-2019
7. Z. Yang, Ph.D., 2019-2019
8. Fan Zhao, Ph.D., 2022-present
9. Chourasia, Ph.D., 2022-present
10. P. Sai Kumar, Ph.D., 2023-present
11. J.D. Mayry, M.Sc., 2022-present
12. S. Saha, M.Sc., 2022-2023
13. Trinavee, M.Sc., 2017-2019
14. P. Chakraborty, P.D.F., 2022-2023
15. S. Mitra, P.D.F., 2022-present
16. M. Gunjan, P.D.F., 2022-2023
17. S. Shyam, P.D.F., 2022-present
18. U. Banerjee, P.D.F., 2021-present
19. S. Walia, P.D.F., 2021-2022

g) GRADUATE COURSES (past seven years)

Convective Heat Transfer, 2019, 2021

h) RESEARCH FUNDING (past seven years as principal investigator)

External

2023-2024, High throughput Ferrofluid Encapsulation using Magnet, NSERC Alliance International, \$25,000

2022-2024, Development of Durable Ultra-low-Pt-loading Catalyst Layers for Polymer Electrolyte Membrane Fuel Cells, MITACS Accelerate, \$360,000

2023, Comprehensive evaluation of surface and adsorption properties of chitosan hydrogels with modified nanocellulose towards heavy metal removal in water, MITACS Globalink Research Award, \$6,000

2022-2025, Development of Sustainable Technology Platform for Paper-based Monitoring Devices, CFI John R. Evans Leaders Fund, \$125,200

2023-2025, Development of Sustainable Technology Platform for Paper-based Monitoring Devices, ORF-RI, \$125,200

2022, To optimize and validate the analytical protocol for recovery of pesticides from water and food samples for further monitoring using dip-and-fold device, MITACS Globalink Research Award, \$6,000

2022-2023, Scalable Liquid-Liquid Encapsulation for Drug Delivery, NSERC Alliance International, \$25,000

2022-2023, Advancing multilayer surface disinfection technologies for modern pandemic protection, NSERC Alliance Canada – Mission, \$745,676

2022-2023, Research tools for understanding soft wetting, NSERC RTI, \$149,673

2022-2023, Market Assessment of a Dip-and-Fold Sensor Device for Rapid Assessment of Insecticides in Water Samples, NSERC Idea to Innovation, \$15,000

2020-2022, Characterization of nano-bubble enabled disinfection system for COVID-19, NSERC Alliance, \$50,000

2020, Characterization of Antiviral Coatings: Wetting studies and efficacy, MITACS Accelerate COVID-19 Call, \$15,000

2020-2022, Testing of antiviral coatings for COVID-19, NSERC Alliance, \$50,000

2020-2022, Development of paper-based rapid diagnostic kit for COVID-19, MITACS Accelerate, \$45,000

2020-2024, Trapped Ions within Artificial Water Channels: A New Paradigm in Quantum Computing, Tri-agency, Federal Government of Canada New Frontiers in Research Fund – Exploration, \$200,000 (indirect costs: \$50,000)

2020-2025, Infrastructure to characterize capillarity and wetting for under-liquid systems, CFI IOF, \$37,500

2020, Biomimetic functional coating for flux control, MITACS Globalink Research Award, \$6,000

2020, Study of the hydrodynamic properties of water in contact with 2D materials, Compute Canada, Resource Allocation Competition, \$7,280

2020-2021, Market Assessment for liquid-liquid encapsulation method and system, NSERC Idea to Innovation, \$14,990

2019-2024, The Shape of Water: Wetting and Beyond, NSERC Discovery, \$195,000

2018-2023, Infrastructure to characterize capillarity and wetting for under-liquid systems, CFI John R. Evans Leaders Fund, \$150,000

2018-2023, Infrastructure to characterize capillarity and wetting for under-liquid systems, ORF-RI, \$150,000

2019-2022, Evaluation of biodegradable films and membranes containing nanocellulose, essential oils, and proteins for food and water safety, FAPESP-SPRINT, CALDO-Waterloo-FAPESP, \$12,500

2018, Nanotechnology for Advanced Manufacturing, NSERC Connection, \$3,473

2017-2019, Water quality analytics, reporting and forecasting using Mobile Water Kit, Ontario Centres of Excellence, TalentEdge Program with SOSCIP, \$115,000

2016-2018, A “Mobile First” learning platform to improve preparedness of post-secondary STEM programs, Ontario Centres of Excellence, Advancing Education, \$250,000 (plus industry cash: \$62,832)

Internal

2017-present, Setting up Micro & Nano-Scale Transport Laboratory, University of Waterloo Start-up Grant, \$750,000

i) PUBLICATIONS

1) Life-time summary:

Books and monographs: 2

Edited books and monographs: 0

Chapters in books and monographs: 7

Refereed journal articles: 179

Refereed conference proceedings: 162

Presentations at conferences (non-refereed):13

Technical reports: 2

Invited/keynote addresses: 186

Others (workshops presented): n/a

2) Details for past seven years

Papers in refereed Journals

1. S. Misra, M. Tenjimayashi, W. Weng, S. K. Mitra, and M. Naito, "Bioinspired Scalable Lubricated Bicontinuous Porous Composites with Self-Recoverability and Exceptional Outdoor Durability", ACS Applied Materials & Interfaces, DOI: 10.1021/acsami.3c03128, 2023.
2. F. Zhao, S. Mitra, A-R. Kim, M. Xu, J. Yao, S. K. Mitra, and B. Zhao, "Determining effective refractive index and elasticity of nanoscale metal - thin, soft polymer bilayers using interference signatures of a glass probe", Colloids & Surfaces A, Vol. 674, 131861, 2023.
3. S. Misra, U. Banerjee, and S. K. Mitra, "Liquid-Liquid Encapsulation: Penetration vs. Trapping at a Liquid Interfacial Layer", ACS Applied Materials & Interfaces, DOI: 10.1021/acsami.3c02177, 2023.
4. M. Gunjan, U. Banerjee, S. Misra, and S. K. Mitra, "Manipulation of ferrofluid wrapped drops: Translation, coalescence and release", Advanced Materials Interfaces, DOI: 10.1002/admi.202300144, 2023.
5. J. Nunes, J. Oliveira, J. Copetti, S. Gajghate, U. Banerjee, S. K. Mitra, and E. M. Cardoso, "Thermal Performance Analysis of Micro Pin Fin Heat Sinks under Different Flow Conditions", Energies, Vol. 16, 3175, 2023.
6. U. Banerjee, S. Shyam, and S. K. Mitra, "Magnetic control of water droplet impact onto ferrofluid lubricated surfaces", Langmuir, Vol. 39, pp. 4049-4059, 2023.

7. S. Saha, M. Sachdev, and S. K. Mitra, "Recent advances in label-free optical, electrochemical and electronic biosensors for glioma biomarkers", *Biomicrofluidics*, Vol. 17, 011502, 2023.
8. S. Shyam, U. Banerjee, P. Mondal and S. K. Mitra, "Impact Dynamics of Ferrofluid Droplet on a PDMS substrate Under the Influence of Magnetic Field", *Colloids & Surfaces A*, Vol. 20, 130911, 2023.
9. R. R. Ferreira, A. G. Souza, R. Felix Barbosa, J. S. Marciano, F. Marques, S. K. Mitra, and D. S. Rosa, "The synergistic effect of nanocellulose and nanocapsules into poly(butylene adipate-co-butylene terephthalate) films for active packaging", *Food Packaging & Shelf Life*, Vol. 35, 100996, 2022.
10. S. Shyam, S. Misra, and S. K. Mitra, "A Universal Capillary-Deflection Based Adhesion Measurement Technique", *J. Colloid & Interface Sci.*, Vol. 630, pp. 322 - 333, 2022.
11. A-R. Kim, S. K. Mitra, and B. Zhao, "Capillary pressure mediated long-term dynamics of thin soft films", *J. Colloid & Interface Sci.*, Vol. 628, pp. 788 - 797, 2022.
12. S. Hazra, S. K. Mitra, and A. K. Sen, "Migration and Spreading of Droplets across a Fluid-Fluid Interface in Microfluidic Coflow", *Langmuir*, Vol. 38, pp. 9660 - 9668, 2022.
13. S. Mitra, S. Misra, T. Tran, and S. K. Mitra, "Probing Liquid Drop Induced Deformation on Soft Solids Using Dual-Wavelength Reflection Interference Contrast Microscopy", *Langmuir*, Vol. 38, pp. 7750 - 7758, 2022.
14. U. Banerjee, S. Misra, and S. K. Mitra, "Liquid-liquid encapsulation of ferrofluid using magnetic field", *Advanced Materials Interfaces*, Vol. 9, 2200288, 2022.
15. S. Hazra, L. Malik, S. K. Mitra, and A. K. Sen, "Interaction between droplets and co-flow interface in a microchannel: Droplet migration and interfacial deformation", *Phys. Rev. Fluids*, Vol. 7, 054201, 2022.
16. S. Oliveira, P. Camani, R. Felix Barbosa, D. Rocha, S. K. Mitra, and D. S. Rosa, "PBAT-based Microfiltration Membranes Using Porogen Saturated Solutions: Architecture, Morphology, and Environmental Profile", *J. of Polymers and the Environment*, Vol. 30, pp. 270 - 294, 2022.
17. A. Souza, R. Ferreira, E. Oliveira, M. Kato, S. K. Mitra, and D. S. Rosa, "Chemical Stabilization behind Cardamom Pickering Emulsion Using Nanocellulose", *Polysaccharides*, Vol. 3, pp. 200 - 216, 2022.
18. D. Debnath, P. Kumar, and S. K. Mitra, "Toward Unveiling the Anomalies Associated with the Spontaneous Spreading of Droplets", *Langmuir*, Vol. 37, pp. 14833 - 14845, 2021.
19. A-R. Kim, S. K. Mitra, and B. Zhao, "Reduced pressure drop in viscoelastic Polydimethylsiloxane wall channels", *Langmuir*, Vol. 37, pp. 14292 - 14301, 2021.
20. F. Marques and S. K. Mitra, "Dip-and-Fold Device: A Paper-Based Testing Platform for Rapid Assessment of Insecticides in Water Samples", *ACS Applied Biomaterials*, Vol. 4, pp. 8456 - 8465, 2021.
21. S. Walia, I. Bhatnagar, J. Liu, S. K. Mitra, and A. Asthana, "A novel method for fabrication of paper-based microfluidic devices using BSA-ink", *International Journal of Biological Macromolecules*, Vol. 193, pp. 1617 - 1622, 2021.
22. S. Misra, H. Teshima, K. Takahashi, and S. K. Mitra, "Reflected Laser Interferometry: A Versatile Tool to Probe Condensation of Low-Surface-Tension Droplets", *Langmuir*, Vol. 37, pp. 8073 - 8082, 2021.

23. S. Hazra, A. Nath, S. K. Mitra, and A. Sen, "Dynamics of rigid particles in a confined flow of viscoelastic and strongly shear-thinning fluid at very small Reynolds numbers", *Physics of Fluids*, DOI: 10.1063/5.0046729, 2021.
24. H. Sun, S. Lin, F. T. T. Ng, S. K. Mitra and Q. Pan, "Synthesis of Shape-Controllable Anisotropic Microparticles and "Walnut-like" Microparticles via Emulsion Interfacial Polymerization", *Langmuir*, Vol. 37, pp. 6007–6015, 2021.
25. K. R. Melayil and S. K. Mitra, "Wetting, Adhesion, and Droplet Impact on Face Masks", *Langmuir*, Vol. 37, pp. 2810–2815, 2021.
26. K. R. Melayil, S. Misra, and S. K. Mitra, "Microparticle suspensions and bacteria laden droplets: Are they the same in terms of wetting signature?", *Langmuir*, Vol. 37, pp. 1588–1595, 2021.
27. A. Das, S. K. Mitra, and A. Bhattacharyya, "Determining the Composition of 100 Nano-Liter Fuel Mixture in a Silicon Micro-Cuvette Using Ultraviolet Absorption Spectroscopy", *Journal of Microelectromechanical Systems*, Vol. 30, pp. 315-321, 2021.
28. K. R. Melayil, S. Misra, and S. K. Mitra, "Friction and adhesion of microparticle suspension on repellent surfaces", *Langmuir*, Vol. 36, pp. 13689–13697, 2020.
29. S. Hazra, S. K. Mitra, and A. K. Sen, "Cross-stream migration of droplets in a confined shear-thinning viscoelastic flow: role of shear-thinning induced lift" *Physics of Fluids*, Vol. 32, 092007, 2020.
30. A. G. Souza, R. R. Ferreira, L. C. Paula, S. K. Mitra, and D. Rosa, "Starch-based films enriched with nanocellulose-stabilized Pickering emulsions containing different essential oils for possible applications in food packaging", *Food Packaging and Shelf Life*, DOI: 10.1016/j.fpsl.2020.100615, 2020.
31. R. Barbosa, E. Yudice, S. K. Mitra, and D. Rosa, "Characterization of Rosewood and Cinnamon Cassia essential oil polymeric capsules: Stability, loading efficiency, release rate and antimicrobial properties", *Food Control*, DOI: 10.1016/j.foodcont.2020.107605, 2020.
32. E. Wagemann, S. Misra, S. Das and S. K. Mitra, "Quantifying water friction in misaligned graphene channels under Ångström confinements", *ACS Applied Materials & Interfaces*, DOI: 10.1021/acsami.0c10445, 2020.
33. A-R. Kim, A. Cholewinski, S. K. Mitra, and B. Zhao, "Viscoelastic tribopairs in dry and lubricated sliding friction", *Soft Matter*, DOI: 10.1039/D0SM00516A, 2020.
34. H. Teshima, S. Misra, K. Takahashi, and S. K. Mitra, "Precursor film mediated thermocapillary motion of low surface tension microdroplets", *Langmuir*, Vol. 36, pp. 5096 - 5105, 2020.
35. E. Wagemann, Y. Wang, S. Das, and S. K. Mitra, "On the Wetting Translucency of Hexagonal Boron Nitride", *Physical Chemistry Chemical Physics*, 22, pp. 7710 - 7718, 2020.
36. E. Wagemann, Y. Wang, S. Das, and S. K. Mitra, "Wettability of Nanostructured Hexagonal Boron Nitride Surfaces: Molecular Dynamics Insights on the Effect of Wetting Anisotropy", *Physical Chemistry Chemical Physics*, Vol. 22, pp. 2488 - 2497, 2020.
37. S. Misra, K. Trinavee, N. S. K. Gunda, and S. K. Mitra, "Encapsulation with an interfacial liquid layer: Robust and efficient liquid-liquid wrapping", *J. Colloid & Interface Science*, Vol. 558, pp. 334 - 344, 2020.

38. S. Hazra, S. K. Mitra, and A. Sen, "Lateral migration of viscoelastic droplets in a viscoelastic confined flow: role of discrete phase viscoelasticity", *Soft Matter*, Vol. 15, pp. 9003 - 9010, 2019.
39. N. S. K. Gunda, S. H. Gautam, and S. K. Mitra, "Artificial Intelligence based mobile application for Water Quality Monitoring", *J. Electrochemical Society*, Vol. 166, pp. B1-B5, 2019.
40. S. Hazra, K. S. Jayaprakash, K. Pandian, A. Raj, S. K. Mitra, and A. K. Sen, "Non-inertial lift induced migration for label-free sorting of cells in a co-flowing aqueous two-phase system", *Analyst*, pp. 2574-2583, 2019.
41. M. Prajapati, P. Kumar, A. K. Das, and S. K. Mitra, "Numerical understanding of free surface vortex driven by rotational field inside viscous liquid", *Heat Transfer Engineering*, DOI: 10.1080/01457632.2019.1628486, 2019.
42. K. Trinavee, N. S. K. Gunda, and S. K. Mitra, "Anomalous wetting of under-liquid systems: oil drops in water and water drops in oil", *Langmuir*, Vol. 34, pp. 11695–11705, 2018.
43. P. Kumar, M. Prajapati, A. K. Das, and S. K. Mitra, "Vortex formation and subsequent air entrainment inside a liquid pool", *Ind. Eng. Chem. Res.*, Vol. 57, pp. 6538-6552, 2018.
44. P. Kumar, P. P. S. Seerha, A. K. Das, and S. K. Mitra, "Proposition of an optical arrangement for interface reconstruction between stratified liquids", *Chemical Eng. Sci.*, Vol. 183, pp. 75-85, 2018.
45. P. Kumar, A. K. Das, and S. K. Mitra, "Air entrainment driven by a converging rotational field in a viscous liquid", *Physics of Fluids*, 102104, 2017.
46. N. S. K. Gunda, S. Dasgupta, and S. K. Mitra, "DipTest: A litmus test for E. coli detection in water", *PLOS ONE*, Vol. 12, e0183234, 2017.
47. B. N. Sahoo, N. S. K. Gunda, S. Nanda, J. Kozinski, and S. K. Mitra, "Development of dual phobic surfaces: Superamphiphobicity in air and oleophobicity in Air and Oleophobicity Underwater", *ACS Sustainable Chemistry & Engineering*, Vol 5, pp. 6716 - 6726, 2017.
48. P. P. S. Seerha, P. Kumar, A. K. Das, and S. K. Mitra, "Proposition of stair climb of a drop using chemical wettability gradient", *Physics of Fluids*, Vol. 29, 072103, 2017.
49. D. Orejon, O. Shardt, N. S. K. Gunda, T. Ikuta, K. Takahashi, Y. Takata, and S. K. Mitra, "Simultaneous Dropwise and Filmwise Condensation on Hydrophilic Microstructured Surfaces", *Int. J. Heat & Mass Transfer*, Vol. 114, pp. 187-197, 2017.
50. B. N. Sahoo, S. Nanda, J. Kozinski, and S. K. Mitra, "PDMS/camphor soot composite coating: towards a self-healing and self-cleaning superhydrophobic surface", *RSC Advances*, Vol. 7, pp. 15027 - 15040, 2017.
51. P. Kumar, A. K. Das, and S. K. Mitra, "Bending and growth of entrained air filament under converging and asymmetric rotational fields", *Physics Fluids*, Vol. 29, 022101, 2017.
52. S. Mitra, N. S. K. Gunda and S. K. Mitra, "Wetting characteristics of underwater micro-patterned surfaces", *RSC Advances*, Vol. 7, pp. 9064-9072, 2017.

Papers in refereed conference proceedings

1. A-R. Kim, S. Mitra, S. Shyam, B. Zhao, and S. K. Mitra, "A hydrogel switch enabling wetting-adhesion transition", *UK Colloids 2023*, Royal Society of Chemistry, Paper#177, July 17 – 19, Liverpool, UK, 2023.

2. S. Shyam, S. Misra, and S. K. Mitra, "A generalized droplet adhesion measurement technique", Paper # 19831, 20th International Conference on Experimental Mechanics, July 2- 7, Porto, Portugal, 2023 (Invited Talk).
3. S. Misra, K. Trinavee, N. S. K. Gunda, and S. K. Mitra, "Impact driven scalable liquid encapsulation: a new paradigm in encapsulation methods", Paper # 725, 11th International Conference on Multiphase Flow, April 2-7, Kobe, Japan, 2023.
4. S. Shyam, U. Banerjee, and S. K. Mitra, "Controlled ferrofluid droplet impact under the influence of a magnetic field", Paper # 139, 11th International Conference on Multiphase Flow, April 2-7, Kobe, Japan, 2023.
5. A. Chaurasia, S. K. Mitra, and A. Bhattacharya, "Numerical Simulations of Two Phase Flows inside a Pore Network: a Window to Pore-scale Oil Recovery Process", Paper # 396, 11th International Conference on Multiphase Flow, April 2-7, Kobe, Japan, 2023.
6. D. Debnath, S. Misra, P. Kumar, and S. K. Mitra, "Understanding the dynamics of under-liquid drop spreading", Paper # 437, 11th International Conference on Multiphase Flow, April 2-7, Kobe, Japan, 2023.
7. A-R. Kim, S. K. Mitra, and B. Zhao, "Characterization of the pressure drop in viscoelastic PDMS wall channels", 14th European Fluid Mechanics Conference EFMC14, September 13 – 16, Athens, Greece, 2022.
8. S. Misra, H. Teshima, K. Takahashi, and S. K. Mitra, "Reflected laser interferometry reveals subtleties of low surface tension microdroplet condensation", 20th International Symposium on Applications of Laser and Imaging Techniques To Fluid Mechanics, July 11 – 14, Lisbon, Portugal, 2022.
9. S. Walia, A. Asthana, J. Liu, and S. K. Mitra, "A Low-Cost Cellulose-Based POC Device for Detection of COVID-19", 241st ECS Meeting, May 29 – June 2, Vancouver, Canada, 2022.
10. F. Marques and S. K. Mitra, "Portable Rapid Paper-Based Device for Analysis of Carbamates and Organophosphates in Water Samples", 241st ECS Meeting, May 29 – June 2, Vancouver, Canada, 2022.
11. J. Mayry, R. Mac, M. Huynh, and S. K. Mitra, "Development of a Low-Cost Lateral Flow Assay for Rapid Detection of Vibrio Cholerae", 241st ECS Meeting, May 29 – June 2, Vancouver, Canada, 2022.
12. S. Misra and S. K. Mitra, "Interferometric investigation of morphological evolution of an encapsulated droplet", 25th International Congress of Theoretical and Applied Mechanics (ICTAM 2020+1), August 22 – 27, Milano, Italy, 2021.
13. S. Hazra, S. K. Mitra, and A. Sen, "Manipulation of droplets in non-Newtonian fluids", M2-205.a, 24th International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS 2020), Online, October 4 – 9, 2020.
14. S. Hazra, S. K. Mitra, and A. Sen, "Improved understanding of particle migration in shear thinning viscoelastic fluid", T3-314.a, 24th International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS 2020), Online, October 4 – 9, 2020.
15. S. Hazra, S. K. Mitra, and A. Sen, "Particle migration in shear thinning viscoelastic fluid", Th8-834.d, 24th International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS 2020), Online, October 4 – 9, 2020.

16. S. Hazra, S. K. Mitra, and A. Sen, "Cell sorting across laminar interface using stiffness contrast", W5-539.e, 24th International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS 2020), Online, October 4 – 9, 2020.
17. S. Misra, H. Teshima, K. Takahashi, and S. K. Mitra, "An efficient framework for studying low surface tension droplet condensation using dual wavelength reflected laser interferometry", Abstract# 180, 20th International Symposium on Applications of Laser and Imaging Techniques to Fluid Mechanics, July 13 -16, Lisbon, Portugal, 2020.
18. S. Mitra, S. Misra, T. Tran and S. K. Mitra, "Probing nanometric surface deformation in soft solids using dual-wavelength reflection interference contrast microscopy", Abstract# 177, 20th International Symposium on Applications of Laser and Imaging Techniques to Fluid Mechanics, July 13 -16, Lisbon, Portugal, 2020.
19. H. Teshima, S. Misra, K. Takahashi, and S. K. Mitra, "Reflection interference contrast microscopy observation of spontaneous movement of condensed microdroplet with extremely low contact angles", Abstract# 178, 20th International Symposium on Applications of Laser and Imaging Techniques to Fluid Mechanics, July 13 -16, Lisbon, Portugal, 2020.
20. A. Huang, O. Abuzalat, S. Homayoonnia, D. Wong, N. S. K. Gunda, S. Kim, S. K. Mitra, "Design of an Arsine Gas Free Rapid Arsenic Detector Using a Novel Luminescent Metal- Organic Framework", Abstract# #IMCS 04-2201, 237th ECS Meeting with IMCS 2020, May 10 – 14, Montreal, Canada, 2020.
21. S. Hazra, S. K. Mitra, and A. Sen, "Viscoelastic based droplet migration and sorting", Abstract #L35.00002, 72nd Annual Meeting of the APS Division of Fluid Dynamics, November 23 – 26, Seattle, USA, 2019.
22. K. Trinavee, S. Misra, N. S. K. Gunda and S. K. Mitra, "Journey of liquid drops inside water: From drop formation to equilibrium", Abstract # O.C.490, International Conference on Multiphase Flow ICMF 2019, May 19 – 23, Rio de Janeiro, Brazil, 2019.
23. S. Misra, N. S. K. Gunda and S. K. Mitra, "Underliquid wetting behavior of graphene: Is the hypothesis of wetting transparency valid?", APS March Meeting, March 4 – 8, Boston, USA, 2019.
24. K. Trinavee, S. Misra, N. S. K. Gunda, and S. K. Mitra, "Transient dynamics of viscous drop impact on immiscible liquid bath: A holistic analysis", APS March Meeting, March 4 – 8, Boston, USA, 2019.
25. S. Hazra, S. K. Mitra, and A. Sen, "Non-inertial lift induced cell sorting in co-flowing aqueous two-phase system", 7th International and 45th National conference on Fluid Mechanics and Fluid Power, December 10-12, Mumbai, India, 2018.
26. S. Badu and S. K. Mitra, "Atomistic level study of wettability of hydrogen passivated silicon oxide surface", 71st Annual Meeting of the APS Division of Fluid Dynamics, November 18 – 20, Atlanta, USA, 2018.
27. S. K. Mitra and S. Badu, "Wettability of solid DNA nucleobases using density functional theory", 71st Annual Meeting of the APS Division of Fluid Dynamics, November 18 – 20, Atlanta, USA, 2018.
28. K. Trinavee, N. S. K. Gunda and S. K. Mitra, "Is Young's equation valid for under-liquid wetting?", 71st Annual Meeting of the APS Division of Fluid Dynamics, November 18 – 20, Atlanta, USA, 2018.

29. K. Trinavee, N. S. K. Gunda and S. K. Mitra, "Wetting of water drops on a PMMA substrate in viscous medium", Paper# ICNMM2018-7631, ASME 16th International Conference on Nanochannels, Microchannels and Minichannels, June 10 - 13, Dubrovnik, Croatia, 2018.
30. S. Badu and S. K. Mitra, "Quantum mechanical study for wetting of the silicon oxide surface", Paper #1239, 16th Conference of the International Association of Colloid and Interface Scientists, IACIS 2018, May 21 – 25, Rotterdam, The Netherlands, 2018.
31. D. Orejon, O. Shardt, N. S. K. Gunda, T. Ikuta, K. Takahashi, Y. Takata, and S. K. Mitra, "Dropwise condensation in presence of microstructures", Paper # 2130, 10th International Conference on Boiling and Condensation Heat Transfer, March 12 – 15, Nagasaki, Japan, 2018.
32. M. Prajapati., P. Kumar, A. K. Das, and S. K. Mitra, "Rotation driven entrainment of air inside liquids: An experimental study", Paper Number: IHMTC2017-13-0737, 24th National and 2nd International ISHMT-ASTFE Heat and Mass Transfer Conference (IH- MTC-2017), December 27-30, BITS Pilani, Hyderabad, India, 2017.
33. P. Kumar, P. P. S. Seerha, A. K. Das, and S. K. Mitra, "Optical reconstruction of wavy interface between stratified liquids: experiment and instrumentation", Paper Number: IHMTC2017-08-0730, 24th National and 2nd International ISHMT-ASTFE Heat and Mass Transfer Conference (IHMTTC-2017), December 27-30, BITS Pilani, Hyderabad, India, 2017.
34. M. Prajapati, P. Kumar, A. K. Das, and S. K. Mitra, "Entrainment of air driven by rotational field inside viscous liquids", Paper Number: 1570340637, 13th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics (HEFAT 2017), July 17- 19, Portorož, Slovenia, 2017.
35. D. Orejon, O. Shardt, N. S. K. Gunda, T. Ikuta, K. Takahashi, Y. Takata, and S. K. Mitra, "The role of micropillar density on condensation heat transfer", paper # TS20-2109, ISMNT-6, The 6th International Symposium on Micro & Nano Technology, March 19 -22, Fukuoka, Japan, 2017.

Invited/keynote addresses

1. "Convergence of Science, Engineering and Technology for Social Impact", Public Lecture, University of Kent, UK, January 24, 2017.
2. "Capillarity & Wetting: Fundamentals and Applications", Maxwell Centre, University of Cambridge, UK, January 25, 2017.
3. "Nano-scale processes: From transport phenomena to biosensor development", Invited Talk, Chemical Nanoscience and Nanotechnology Interest Group Meeting, Royal Society of Chemistry, Keele University, UK, January 26, 2017.
4. "Convergence of Science and Engineering for Globally Challenging Problems", ECE Distinguished Seminar Series, McMaster University, Hamilton, Canada, February 23, 2017.
5. "Smart Materials for Globally Challenging Problems in Water, Energy and Environment", Keynote Talk, 3rd Annual World Congress of Smart Materials – 2017, Bangkok, Thailand, March 16, 2017.
6. "Transport processes in micro and nano-scale confinements", Keynote Talk, 6th International Symposium on Micro & Nano Technology, Fukuoka, Japan, March 21, 2017.
7. "New Analytical Tools for Water Quality Monitoring and Treatment", Keynote Talk, 5th Annual Conference on AnalytiX-2017, Fukuoka, Japan, March 22, 2017.

8. "EnVison 2017: Decarbonizing Energy and the Environment", Closing Remarks, University of Victoria, Victoria, Canada, April 28, 2017.
9. "Convergence of Science and Engineering for Globally Challenging Problems", IESVic Seminar, University of Victoria, Victoria, Canada, May 29, 2017.
10. "Convergence of Science and Engineering for Globally Challenging Problems", Universidade Federal Fluminense, Rio de Janeiro, Brazil, June 9, 2017.
11. "Capillarity & Wetting: Old wine in a new bottle", Invited Keynote Talk, 9th World Conference on Experimental Heat Transfer, Fluid Mechanics and Thermodynamics ExHFT-9, Foz do Iguaçu, Brazil, June 19, 2017.
12. "Convergence of Science & Engineering for Globally Challenging Problems", Invited Talk, EMN & Quantum Summit 2017, Chengdu, China, October 12, 2017.
13. "Fluid transport at Nano-scale: Fundamentals and Applications", Keynote Talk, BIT Conference Nano Science and Technology, Fukuoka, Japan, October 24, 2017.
14. "Convergence of Science, Engineering and Technology for Global Challenges", National Institute for Material Science (NIMS), Japan, October 26, 2017.
15. "Achieving dual phobic surfaces using nanostructured composite coatings", Keynote Talk, 22nd International Conference and Expo on Nanoscience and Molecular Nanotechnology, Frankfurt, Germany, November 6, 2017.
16. "Rapid detection of E. coli in contaminated water", Keynote Talk, World Gene Convention-2017, Macau, November 13, 2017.
17. Tech Talk, India-Canada CII-DST Technology Summit, New Delhi, November 15, 2017.
18. "Capillarity & Wetting: Fundamentals and Applications", Mechanical Engineering Department, IIT Delhi, New Delhi, India, November 16, 2017.
19. "Capillarity & Wetting: Fundamentals and Applications", Centre for Research in Nanoscience and Nanotechnology, University of Calcutta, Kolkata, India, December 18, 2017.
20. "Micro and Nano-scale Transport to Solve Global Challenges", Keynote Talk, 24th National and 2nd International ISHMT-ASTFE Heat and Mass Transfer Conference, BITS Pilani, Hyderabad, India, December 30, 2017.
21. "Convergence of Science, Engineering and Technology for Global Challenges", IEEE AP/ED Distinguished Lecture, IIT Bombay, India, January 4, 2018.
22. "The Federal Budget: A call to action", Editorial, Science & Innovation in Federal Budget 2018, Canadian Science Policy Centre, March 2, 2018.
23. "Wonderful World of Capillarity and Wetting", Department of Physics & Astronomy Colloquium Series, University of Waterloo, Canada, March 6, 2018.
24. "Wonderful World of Capillarity and Wetting", Centre for Nano Mechanics, Tsinghua University, Beijing, China, March 28, 2018.
25. "Capillarity & Wetting: Fundamentals and Applications", Tianjin University, Tianjin, China, March 30, 2018.
26. "Convergence of Science, Engineering and Technology for Global Challenges", College of Nanoscience and Technology, Soochow University, Suzhou, China, April 16, 2018.
27. "Convergence of Science, Engineering and Technology for Global Challenges", Faculty of Mechanical, Maritime and Materials Engineering (3mE), TU Delft, Netherlands, June 29, 2018.

28. "Micro & Nano-scale Transport in Porous Media: Fundamentals & Applications", Invited Talk, 12th International Conference on Advanced Computational Engineering and Experimenting, ACEX-2018, Amsterdam, July 4, 2018.
29. "Waterloo Institute for Nanotechnology: Solving global challenges by bridging the length scales", Keynote Talk, 24th World Congress on Nanomaterials and Nanotechnology, Bangkok, Thailand, July 12, 2018.
30. "Waterloo Institute for Nanotechnology: Solving global challenges", KMUTT- Bangkhuntian Campus, Bangkok, Thailand, July 12, 2018.
31. "Underliquid Wetting: Fundamentals and Applications", Max Planck Institute for Polymer Research, Mainz, October 23, 2018.
32. "Convergence of Science, Engineering and Technology for Global Challenges", Chemistry Institute – UNICAMP, Campinas, Brazil, December 14, 2018.
33. "Nano Breakfast – Talking about Innovation and Entrepreneurship", Invited talk, Consulate General of Canada, Sao Paulo, Brazil, December 18, 2018.
34. "Convergence of Science, Engineering and Technology for Global Challenges", Fundação Universidade Federal do ABC, Santo Andre, Brazil, December 18, 2018.
35. "Convergence of Science, Engineering and Technology for Global Challenges", AMOLF, Amsterdam Research Park, Amsterdam, March 25, 2019.
36. "Convergence of Science, Engineering and Technology for Global Challenges", Distinguished Lecture Series, Mechanical Engineering, Brigham Young University, Provo, Utah, April 1, 2019.
37. "Nanotechnology: Waterloo Institute for Nanotechnology shaping UN Sustainable Development Goals", Keynote Lecture, Analytix-2019, Singapore, April 12, 2019.
38. "Underliquid wetting: Fundamentals and Applications", School of Mechanical & Aerospace Engineering, Nanyang Technical University, Singapore, April 14, 2019.
39. "Convergence of Science, Engineering and Technology for Global Challenges", National Nanotec Centre (NANOTEC), Bangkok, Thailand, April 19, 2019.
40. "Underliquid wetting: Fundamentals and Applications", Plenary Talk, ASME International Conference on Nano, Micro, Mini Channels ICNMM 2019, St. John's, Newfoundland and Labrador, June 26, 2019.
41. "Waterloo Institute for Nanotechnology: Integration Industry 4.0 and Society 5.0", Invited Talk, Directors' Forum, CHINANano2019, Beijing, August 16, 2019.
42. "Devices at Micro/Nano-scale for solving globally challenging problems", Invited Talk, CHINANano2019, Beijing, August 18, 2019.
43. "Water Quality Monitoring: Towards Frugal Innovation", Lunch Talk, Deltares, Utrecht, the Netherlands, November 5, 2019.
44. "Understanding wetting of 2D materials", Keynote Talk, International Conference on Nanoscience and Nanotechnology ICONN 2020, Brisbane, Australia, February 13, 2020.
45. "Convergence of Science & Engineering for Global Challenges", Invited Talk, School of Biomedical Engineering, University of Sydney, Sydney, February 15, 2020.
46. Moderator, "Post COVID-19 – Rebooting with Research: Viral detection and mitigation", Panelists: Karim Karim - Executive Director, Centre for Bioengineering and Biotechnology; Roderick Slavcev - Associate Professor, School of Pharmacy; Shirley Tang - Associate Dean

Research, Faculty of Science; Ryan Denomme - Founder and CEO, Nicoya Lifesciences; Alex Wong - Co-founder, Chief Scientist, DarwinAI, University of Waterloo, June 18, 2020.

47. "Applications of IoT and Mobile Platform", Panelist, Project Tech Conferences, Waterloo, July 31, 2020.
48. "Waterloo Institute for Nanotechnology (WIN): Sustainable Innovation Ecosystem", jointly with Oleg Stukalov, Nanotechnology Innovation and Research Bootcamp 2021, Organized by African MRS, August 12, 2021.
49. "Nano Sensing for Health Care", Invited Talk, Tata Consultancy Services India, August 23, 2021.
50. "Capillarity and Wetting: An Odyssey", Invited Talk, Institute for Complex Molecular Systems, TU/e, Eindhoven, December 15, 2022.
51. "Waterloo Institute for Nanotechnology: Creating Sustainable Solutions", TNO-Holst Center, Eindhoven, March 21, 2022.
52. "Waterloo Institute for Nanotechnology: Creating Sustainable Future", Institute Lecture, IIT Kharagpur, India, April 12, 2022.
53. "Magic at the Interfaces", Institute Lecture, IIT Kharagpur, India, April 12, 2022.
54. "Scalable Liquid Encapsulation: A new paradigm in encapsulation method", Invited Talk, ACEX-2022, Florence, Italy, July 5, 2022.
55. "Reflection Interference Contrast Microscopy: a Versatile Tool for Wetting Studies", Keynote Talk, 19th International Conference on Experimental Mechanics ICEM 2022, Krakow, Poland, July 18, 2022.
56. "Paper substrates for Biosensors", Invited Talk, 2022 International Congress on Advanced Materials Sciences and Engineering, Opatija, Croatia, July 22, 2022.
57. "Novel Encapsulation Technology: Removing Need for Microplastics", Plenary Talk, Global Experts Meet on Mechanical Engineering and Mechatronics (GEMMEM22), Amsterdam, The Netherlands, July 28, 2022.
58. "Magic at Interfaces", Keynote Talk, 9th International and 49th National Conference on Fluid Mechanics and Fluid Power (FMFP 2022), Roorkee, India, December 15, 2022.
59. "Waterloo Institute for Nanotechnology: Solving Global Challenges", Invited Talk, 15th Nanotech Association Conference, Tokyo, Japan, February 2, 2023.
60. "Magic at Interfaces", Indian Institute of Science (IISc) Bangalore, India, March 16, 2023.
61. "Magic at Interfaces", Jadavpur University, Kolkata, India, March 21, 2023.
62. "Magic at Interfaces", Invited Talk, 18th National Science and Technology Development Agency (NSTDA) Annual Conference (NAC 2023), Bangkok, Thailand, March 31, 2023.
63. "Magic at Interfaces", Institute for Multiscale Thermofluids Seminar Series, University of Edinburgh, Edinburgh, Scotland, May 18, 2023.
64. "Biosensors: Empowering Personal Health", World Micromachine Summit MMS 2023, Bucharest, Romania, May 22, 2023.
65. "Magic at Interfaces", Nano Seminar, National Research Council (NRC), Edmonton, Canada, June 23, 2023.
66. "Encapsulation, Translation and Release of Core Drops: Fundamentals & Applications", Analytix-2023, Amsterdam, Netherlands, July 13, 2023.
67. "Magic at Interfaces", University of Surrey, Guildford, UK, July 20, 2023.

DATE: January 2024