ASME® 2019 ICNMM

17th International Conference on Nanochannels, Microchannels, and Minichannels

Program

CONFERENCE
June 23–26, 2019

EXHIBITION
June 24–26, 2019

St. John's Convention Centre,
St. John's, Newfoundland, Canada

The American Society of Mechanical Engineers®
ASME®

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SETTING THE STANDARD

Welcome

Amy Betz
General Chair

Yuri Muzychka
Co-Chair

Patty Weisensee
Poster Session Chair

We welcome you to the 17th ASME International Conference on Nanochannels, Microchannels, and Minichannels (ICNMM 2019) and to St. John's, Newfoundland, Canada. St. John's is one of the oldest cities and is the most eastern port in North America. It is home to Memorial University, and the city has a unique juxtaposition of the Open Ocean and rocky cliffs with a vibrant and colorful downtown. On Wednesday, please join us for a tour of the National Research Council of Canada's Ocean Test Facilities. They are located on the University campus and comprised of three test basins for Ocean and Marine research. These are premier facilities for undertaking fluids research in ocean simulated environments.

ICNMM provides a global platform for researchers to exchange information and identify research needs in the emerging areas of micro- and nanoscale transport processes and systems encompassing engineering, basic sciences, and biomedical disciplines. This field of science is becoming extremely important in a number of emerging technologies. It has already found applications in microprocessor chip cooling, biological sciences (DNA detection), pharmaceutical sciences (micromixers and microreactors), fuel cells (multiphase flow microchannels and gas diffusion layer), and micro-power generation.

Our program provides a unique opportunity for interdisciplinary researchers to exchange ideas and discuss future directions, in both fundamental science and applications, with academic and industrial leaders. ICNMM 2019 is filled with rich content, innovative research, and presentations. This year's program contains five Plenary and five Keynote Talks, and a Student Poster Competition. This year we have updated the format of the poster session to also include "Lightning Talks" in a Plenary session, providing students the opportunity to deliver short oral presentations of their research to all conference participants before the one-on-one interactions at the full poster session. Thanks to the generosity of the National Science Foundation, participating students may receive travel support to defray the cost of attending the conference.

Our special gratitude is extended to all of the volunteers whose hard work has made this conference happen, including the Organizing Committee consisting of the General Committee Organizers; the Technical Program Committee consisting of Technical Track, Topic, and Session Organizers; the ICNMM Advisory Committees; the Plenary Speakers; Panel Moderators and Panelists; Technical Paper Authors and Co-Authors; "Technical Presentation Only" Speakers; and, finally, to all the technical reviewers whose contributions ensured the quality of the conference.

We would also like to thank the generous sponsors of the conference: Kansas State University, Memorial University, and Springer.

We hope you enjoy the conference. With our very best wishes.

Contents

General Information

REGISTRATION HOURS AND LOCATION

Registration will be located by Coat Check/Registration in the Lobby. The hours are as follows:

Sunday	
June 23	1:00PM–5:00PM
Monday	
June 24	7:00AM–5:00PM
Tuesday	
June 25	7:00AM–5:00PM
Wednesday	
June 26	7:00AM–1:00PM

NAME BADGES

Please wear your name badge at all times. Admission to all conference functions will be by the badges only (unless noted otherwise). Your badge also provides a helpful introduction to other attendees.

AUDIOVISUAL EQUIPMENT IN SESSION ROOMS

All Technical sessions are equipped with one LCD projector and one screen. Laptops will NOT be provided in the sessions. Presenters MUST bring their own or arrange in advance to share.

TICKETED FUNCTIONS/ITEMS

Some conference functions will require a ticket for admittance. Please check with a conference representative if you have any questions regarding specific events. If you would like to bring a guest to the banquet, you must purchase a ticket on their behalf.

HAVE QUESTIONS ABOUT THE MEETING?

If you have any questions or need assistance, an ASME representative will be located in the registration area.

COMMITTEE MEETING – ICNMM ORGANIZERS
VICTORIA 3, LEVEL 3

The 2019 Conference Organizers will hold a committee meeting on Sunday, June 23rd from 5:00PM to 8:00PM.

OPENING RECEPTION
LOBBY FOYER, LOBBY LEVEL

The Opening Reception will be held on Monday, June 24th from 5:30PM to 7:00PM. Enjoy socializing with attendees and take the time to meet the conference organizers. Tickets are required unless you are wearing a conference badge.

BANQUET
BANNERMAN BALLROOM 2&4, LOBBY LEVEL

The Honors & Awards Banquet will be held on Tuesday, June 25th from 5:30PM to 7:00PM. Tickets are available for purchase (attendees = $0 and guests = $75.00).

Schedule at a Glance

MONDAY, JUNE 24, 2019

EVENT	Breakfast		
LOCATION	Bannerman Ballroom 1&3, Lobby Level		
7:00AM–7:45AM			
EVENT	Opening Remarks and Plenary Session		
LOCATION	Bannerman Ballroom 2&4, Lobby Level		
7:45AM–8:35AM	Opening Remarks (Amy Betz, General Conference Chair) “Microfluidics for Life Science Applications and Analytics“ by Dirk Janasek		
EVENT	Keynote Session		
LOCATION	Bannerman Ballroom 2&4, Lobby Level		
8:35AM–9:00AM	“Modeling of Bio-Particle Motion in Microchannels” by Barbaros Cetin		
EVENT	Break/Exhibits		
LOCATION	Lobby Foyer		
9:00AM–9:15AM			
EVENT	Plenary Session		
LOCATION	Bannerman Ballroom 2&4, Lobby Level		
9:15AM–10:05AM	“Transport in Nanopores for Single Molecule and Single Cell Analysis” by MinJun Kim		
EVENT	Keynote Session		
LOCATION	Bannerman Ballroom 2&4, Lobby Level		
10:05AM–10:30AM	“Mathematical Modeling of Macromolecule Transport in Dynamic, Heterogeneous Micropores Within Biomaterials” by Ashlee Ford Versypt		
EVENT	Break/Exhibits		
LOCATION	Lobby Foyer		
10:30AM–10:45AM			
EVENT	Technical Sessions		
LOCATION	Churchill 1	Churchill 2	Pippy 1
10:45AM–12:15PM	Session 1-1: Single-Phase Flow	Session 13-1: Bio and Biomedical Engineering	Session 6-1: Interfacial Phenomena on Micro and Nanoengineered Surfaces
EVENT	Lunch		
LOCATION	On Own (Lunch will not be provided by the conference.)		
12:15PM–2:15PM			
EVENT	Plenary Session		
LOCATION	Bannerman Ballroom 2&4, Lobby Level		
2:15PM–3:05PM	"Advances in Icing Mitigation Using Surface Engineering: Lessons From Lab and Field Tests" by Alidad Amirfazli		
EVENT	Keynote Session		
LOCATION	Bannerman Ballroom 2&4, Lobby Level		
3:05PM–3:30PM	“The 70th Anniversary of the Lockhart-Martinelli Model for Two Phase Flow in Pipes” by Yuri Muzychka		
EVENT	Break/Exhibits		
LOCATION	Foyer		
3:30PM–3:45PM			
EVENT	Technical Sessions		
LOCATION	Churchill 1	Churchill 2	Pippy 1
3:45PM–5:15PM	Session 2-3: Two-Phase Flows	Session 4-1: Condensation and Freezing on Heat Transfer Surfaces	Session 7-1: Conjugate Micro and Nanoscale Heat Transfer
EVENT	Opening Reception		
LOCATION	Lobby Foyer		
5:30PM–7:00PM			

TUESDAY, JUNE 25

EVENT	Breakfast		
LOCATION	Bannerman Ballroom 1&3, Lobby Level		
7:00AM – 7:45AM			
EVENT	Opening Remarks and Keynote Session		
LOCATION	Bannerman Ballroom 2&4, Lobby Level		
7:45AM – 8:35AM	Opening Remarks (Patricia Weisensee, Chair, Poster Sessions) “Microscale Physics of Phase Change Process: Answers to Century Old Questions and New Discoveries” by Saeed Moghaddam		
EVENT	Lightning Talks		
LOCATION	Bannerman Ballroom 2&4, Lobby Level		
8:35AM – 9:05AM	Poster Session Introduction		
EVENT	Break/Exhibits/Poster Session		
LOCATION	Lobby Foyer		
9:05AM – 10:20AM			
EVENT	Technical Sessions		
LOCATION	Churchill 1	Churchill 2	Pippy 1
10:20AM – 11:50PM	Session 6-2: Interfacial Phenomena on Micro and Nanoengineered Surfaces	Session 8-1: Electrokinetic and Dielectrophoretic Phenomena	Session 4-2 Condensation and Freezing
EVENT	Lunch		
LOCATION	On Own (Lunch will not be provided by the conference.)		
11:50PM – 2:00PM			
EVENT	Plenary Session		
LOCATION	Bannerman Ballroom 2&4, Lobby Level		
2:00PM – 2:50PM	“Towards Modular Droplet Microfluidic Systems: Tool for Combinatorial High Throughput Testing” by Carolyn Ren		
EVENT	Keynote Session		
LOCATION	Bannerman Ballroom 2&4, Lobby Level		
2:50PM – 3:15PM	“Modeling Transport Phenomena in Diabatic Internal Flows in the Cassie State” by Marc Hodes		
EVENT	Break/Exhibits		
LOCATION	Foyer		
3:15PM – 3:30PM			
EVENT	Technical Sessions		
LOCATION	Churchill 1	Churchill 2	Pippy 1
3:30PM – 5:00PM	Session 2-2: Two-Phase Flows	Session 1-2: Single-Phase Flow	Session 12-1: Microfluidics with Chemical Reactions
EVENT	Awards Banquet		
LOCATION	Lobby Foyer		
5:30PM – 7:00PM			

Schedule at a Glance

WEDNESDAY, JUNE 26

EVENT	Breakfast
LOCATION	Bannerman Ballroom 1&3, Lobby Level
7:00 AM – 8:00 AM	
EVENT	Plenary Session
LOCATION	Bannerman Ballroom 2&4, Lobby Level
8:00 AM – 8:50 AM	“Underliquid Wetting: Fundamentals and Applications” by Sushanta Mitra
EVENT	Keynote Session
LOCATION	Bannerman Ballroom 2&4, Lobby Level
8:50 AM – 9:15 AM	“Multiphase Flows and Heat Transfer in the Food, Energy, Water Nexus” by Melanie Derby
EVENT	Break/Exhibits
LOCATION	Lobby Foyer
9:15 AM – 9:30 AM	
EVENT	Technical Sessions
LOCATION	Churchill 1
9:30 AM – 11:00 AM	Session 11-1: Transport in Energy Systems
EVENT	Break/Exhibits
LOCATION	Foyer
11:00 AM – 11:15 AM	
EVENT	Technical Sessions
LOCATION	Churchill 1
11:15 AM – 12:45 PM	Session 2-1: Two-Phase Flows
EVENT	Lunch
LOCATION	Bannerman Ballroom 1&3, Lobby Level
12:45 PM – 2:00 PM	Buffet Lunch Provided
EVENT	Tour
LOCATION	Bannerman Ballroom 2&4, Lobby Level
2:00 PM – 5:15 PM	Tour: National Research Council of Canada (NRC) Ocean, Coastal and River Engineering Research Centre

PLENARY SPEAKER
MONDAY, JUNE 24
7:45 AM–8:35 AM

Dirk Janasek,
Leibniz Institute of Analytical Sciences
"Microfluidics for Life Science Applications and Analytics"

Abstract: Microfluidic systems have gained considerable attention over the last three decades because of their advantages according to scaling laws. While there are many approaches and attempts in (basic) research, only few made it to mass production and routine applications. Such difficulties in the translation from research to application often originate from the rapid prototyping processes used in the research environment, the sometimes poor reproducibility, and an often not very simple applicability for non-experts. Thus, overcoming these restrictions is a major task to promote the acceptance and usage of microfluidic devices.

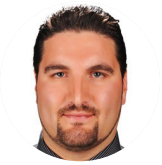
One focus in our group is the establishment and optimization of free-flow electrophoresis (FFE) in a miniaturized format. FFE can be applied to upstream sample preparation and downstream product purification due to the continuous electrophoretic separation in a two-dimensional fashion. The miniaturization of this technique allows the handling of minute amounts of sample and reagents, and even enables the implementation of special separation modes. A big challenge is the design of electrode structures for voltage coupling preventing electrolysis-generated gas bubbles from entering the separation compartment since they can cause disturbances of the separation process.

Another focus is the coupling of miniaturized FFE (µFFE) to new detection methods. The widespread fluorescence detection requires intrinsic fluorescence or the employment of fluorescent dyes, which, e.g., conflicts with the product purification part. Thus, non-destructive detection like molecular spectroscopy would be favorable. However, due to its great importance in the biochemical field and for quality control also, interfacing to mass-spectrometry becomes a big issue.

Biography: Dirk Janasek studied Biochemistry at the Martin-Luther-University Halle–Wittenberg (Germany) and received his PhD degree in the field of chemiluminometric biosensors. After a postdoc working on amperometric biosensors, he joined the Manz group at Imperial College London in 2002 as a Leopoldina scholarship holder where he became acquainted with the lab-on-a-chip field. Since 2003 he has been employed at ISAS and is responsible for microfluidics and miniaturized separation systems to be applied to the preparation, manipulation, and analytics of minute sample amounts of bio-/chemical/technological and clinical origin.

Plenary & Keynote Presentations

KEYNOTE SPEAKER
MONDAY, JUNE 24
8:35 AM–9:00 AM



Barbaros Cetin,
Bilkent University
"Modeling of Bio-Particle Motion in Microchannels"

Abstract: Manipulation of the biological particles is the main ingredient for many microfluidic applications. Modeling of the motion of particles with different geometry and size in microchannels is crucial for the design of microfluidic platforms. For the manipulation of particles, there are passive hydrodynamic techniques that utilize the channel geometry and flow field as well as active techniques that employ external forces such as electric, acoustic, magnetic, and/or optic. For microfluidic applications, there are commonly two approaches to simulate the particle trajectories: (i) Lagrange tracking method, (ii) stress tensor method. In the Lagrange tracking method, flow, electric, and/or acoustic fields are obtained by neglecting the presence of particles (i.e., assuming particles as point particles). This approach is acceptable when the size of the particles is small relative to the microchannel, and for the dilute solution in which the particle-particle interactions can be neglected. In the stress tensor method, the field variables are determined with presence of the finite particle size. In this approach, resulting forces and torques acting on the particles are obtained by integrating the corresponding tensors. Therefore, particle-particle and/or particle-wall interactions can be captured. Volume based numerical models are faced with algorithmic and computational challenges in resolving complex particle shapes and in efficient implementation of particle motion. In addition, resolution of interactions between close particles and surfaces often require unusually high mesh density. These challenges are eliminated by using the Boundary Element Method (BEM), which requires discretization of the particle and channel surfaces, which effectively reduces 3D problems to 2D and 2D problems to 1D. In addition, the derivative of the field variables, which are essential for calculation of the forces acting on the particles, comes as a part of the solution without requiring any numerical approximation. In this talk, different modeling strategies will be discussed and modeling of different cases for hydrodynamic, electrokinetic and acoustophoretic bioparticle manipulation will be presented.

Biography: Dr. Barbaros Çetin received his B.S. (2002) and M.S. (2005) in Mechanical Engineering at Middle East Technical University, Ankara, Turkey. He received his PhD (2009) in the Department of Mechanical Engineering at Vanderbilt University where he focused on electrokinetic transport and particle manipulation in lab-on-a-chip devices for biomedical applications. Following his PhD, he became a faculty member in Middle East Technical University-Northern Cyprus Campus Mechanical Engineering Program. In 2011, he became a faculty member in the Mechanical Engineering Department at I.D. Bilkent University, Ankara, Turkey. His current research interests include particle manipulation for microfluidic applications, modeling of particle motion using the boundary element method, and modeling, fabrication, and experimentation of flat-grooved heat pipes. Dr. Çetin is the recipient of the 2015 Bilkent University Distinguished Teacher Award, 2017 Outstanding Young Scientist Award, of the Turkish Academy of Sciences (TÜBA-GEBİP), 2017 METU Prof. Dr. Mustafa N. Parlar Research Incentive Award and 2018 Science Academy Association Distinguished Young Scientist Award (BAGEP).

PLENARY SPEAKER
MONDAY, JUNE 24
9:15 AM–10:05 AM

MinJun Kim,
Southern Methodist University
"Transport in Nanopores for Single Molecule and Single Cell Analysis"

Abstract: Solid-state nanopores were developed almost a decade ago as an alternative to protein nanopores for next-generation sequencing of DNA molecules. In recent years, however, they have drawn significant attention as an analytical tool to study other nanoscale analytes. Compared to biological nanopores, solid-state nanopores are more robust and can be tuned in size and geometry to meet various requirements for a wide range of applications. A size scale that spans from single macromolecules (<10 nm) to single-particle viruses (50–200 nm) and even single-cell microorganisms such as bacteria (1 –2 μm) makes solid-state nanopores a powerful analytical tool for single-particle, single-molecule, or single-cell research. In fact, nanopores can provide a unique opportunity to bridge the gap between single-molecule and single-cell research. In this presentation, we first review micro-/nanofabrication techniques to achieve a wide range of pore size and geometry and then discuss applications in sensing and biophysical analysis of single-molecules and single cells. Particularly, we will review our recent works on single-protein research, including protein binding and protein-protein interactions as well as single-virus research for sensing human immunodeficiency virus (HIV), and study biophysical deformation of single viruses as they translocate through the pore.

Biography: Dr. MinJun Kim is presently the Robert C. Womack Endowed Chair Professor of Engineering at the Department of Mechanical Engineering, Southern Methodist University. He received his B.S. and M.S. degrees in Mechanical Engineering from Yonsei University in Korea and Texas A&M University, respectively. Dr. Kim completed his Ph.D. degree in Engineering at Brown University, where he held the prestigious Simon Ostrach Fellowship. Following his graduate studies, Dr. Kim was a postdoctoral research fellow at the Rowland Institute in Harvard University. He joined Drexel University in 2006 as Assistant Professor and was later promoted to Professor of Mechanical Engineering and Mechanics. Dr. Kim has been exploring biological transport phenomena, including cellular/molecular mechanics and engineering in novel nano-/microscale architectures to produce new types of nanobiotechology, such as nanopore technology and nano/micro robotics. His notable awards include the National Science Foundation CAREER Award (2008), Drexel Career Development Award (2008), Human Frontier Science Program Young Investigator Award (2009), Army Research Office Young Investigator Award (2010), Alexander von Humboldt Fellowship (2011), KOFST Brain Pool Fellowship (2013 & 2015), Bionic Engineering Outstanding Contribution Award (2013), Louis & Bessie Stein Fellowship (2008 & 2014), ISBE Fellow (2014), ASME Fellow (2014), Top10 Netexplo Award (2016), KSEA & KOFST Engineer of the Year Award (2016), IEEE Senior Member (2017), and Gerald J. Ford Research Fellowship (2018).

Plenary & Keynote Presentations

KEYNOTE SPEAKER
MONDAY, JUNE 24
10:05 AM–10:30 AM

Ashlee Ford Versypt,
Oklahoma State University
"Mathematical Modeling of Macromolecule Transport in Dynamic, Heterogeneous Micropores Within Biomaterials"

Abstract: Chemical reactions that remodel or degrade porous biomaterials, such as polymeric drug delivery devices for extended release pharmaceuticals or extracellular fibrous matrices in various tissues, are ubiquitous. Often these porous materials are considered as static environments through with molecular transport occurs or over which cell migration occurs. However, the pore structure and the stiffness of these biomaterials can evolve heterogeneously over time resulting in a dynamic domain for biotransport. We have developed mathematical models to account for a variety of transport modes in biomaterials undergoing remodeling reactions. Case studies of macromolecular protein drug release from porous bulk-eroding polymer microspheres, migration of cancer cells over a remodeling extracellular matrix in a tumor microenvironment, escape of bacteria through degraded tuberculosis granulomas, and transport of proteins through filtration tissues in the kidney subject to diabetic glucose-induced tissue damage will be discussed.

Biography: Dr. Ashlee N. Ford Versypt holds three degrees in chemical engineering: a B.S. from the University of Oklahoma and an M.S. and a Ph.D. from the University of Illinois at Urbana-Champaign. During graduate school, Dr. Ford Versypt was awarded the Department of Energy Computational Science Graduate Fellowship (DOE CSGF) and the National Science Foundation Graduate Research Fellowship. In 2013, Dr. Ford Versypt was recognized as the Frederick A. Howes Scholar in Computational Science, which is awarded annually to a recent alumnus of the DOE CSGF for outstanding leadership, character, and technical achievement. In 2012–2014, Dr. Ford Versypt was a postdoctoral research associate with Richard Braatz in the Department of Chemical Engineering at the Massachusetts Institute of Technology. Currently, Dr. Ford Versypt is an assistant professor in the School of Chemical Engineering at Oklahoma State University (OSU). She is a member of the Harold Hamm Diabetes Center and the Stephenson Cancer Center at the University of Oklahoma Health Sciences Center, the Interdisciplinary Toxicology Program at OSU, and the Oklahoma Center for Respiratory Infectious Diseases. Dr. Ford Versypt is active in engaging the public in science through more than 60 events for K-12, collegiate, and lay audiences. She has received a number of awards for her research and teaching, including the NSF CAREER Award in 2019, AIChE 35 Under 35 for 2017, and the OSU College of Engineering, Architecture and Technology Excelled Teacher Award in 2017.

PLENARY SPEAKER
MONDAY, JUNE 24
2:15 PM–3:05 PM

Alidad Amirfazli,
York University
"Advances in Icing Mitigation Using Surface Engineering: Lessons From Lab and Field Tests"

Abstract: Icing of structures is a major hazard from aviation (e.g., inflight icing) to energy production (e.g. icing of wind turbines) to maritime (e.g., offshore platforms and patrol ships). Icing is usually the result of a droplet impacting a surface and staying long enough to freeze on the surface. Traditionally active methods such as thermal, mechanical, or chemical treatment has been used to mitigate icing or deice a structure. These methods are usually energy intensive, or for some applications not practical. The focus on using coatings of various kinds to mitigate icing, or the required energy for deicing, has been intense in the past 15 years. Often wettability of coatings is used as a first indicator for its effectiveness in aiding with deicing or mitigating the icing in the first place. This is so, as it is known that wettability of a surface influences how a droplet will remain or can be removed from a surface; also surface wettability will determine the nucleation sites for ice or frost to form, which in turn will cause freezing of the water on the surface. As such, this talk will focus on how wettability of a surface affects icing before ice is formed. Surface wettability effects on three different aspects related to icing will be discussed: (i) how a droplet will shed from a surface, (ii) delay in freezing of a droplet on a surface, and (iii) drop impact behavior. Examples from laboratory tests to field tests will be discussed.

Biography: Alidad Amirfazli is a Professor at the York University in Toronto, Canada where he founded the Department of Mechanical Engineering in 2013. He formerly held the Canada Research Chair in Surface Engineering at the University of Alberta, Canada. Amirfazli has produced exciting results in wetting behavior of surfaces, icing, drop adhesion and shedding, and drop impact. He has had more than 250 scientific contributions maritime, many in prestigious peer-reviewed journals; he has also given many invited talks at international level. He is the Editor for *Advances in Colloid and Interface Science*, Associate Editor for *Interfacial Phenomena & Heat Transfer*, and an Editorial board member for other journals. Dr. Amirfazli has been the recipient of the Martha Cook Piper Research prize, and Killam Annual Professorship. He is a Fellow of the Engineering Institute and Canada, and CSME. In 2014 he was inducted into the Royal Society of Canada's College of New Scholars, Artists and Scientists. He also served on the board of Professional Engineers of Alberta and has been a consultant with various companies in USA, Europe, and Canada. Engineering Outstanding Contribution Award (2013), Louis & Bessie Stein Fellowship (2008 & 2014), ISBE Fellow (2014), ASME Fellow (2014), Top10 Netexplo Award (2016), KSEA & KOFST Engineer of the Year Award (2016), IEEE Senior Member (2017), and Gerald J. Ford Research Fellowship (2018).

Plenary & Keynote Presentations

KEYNOTE SPEAKER
MONDAY, JUNE 24
3:05 PM–3:30 PM

Yuri Muzychka,
Memorial University
"The 70th Anniversary of the Lockhart-Martinelli Model for Two Phase Flow in Pipes"

Abstract: The 70th Anniversary of the pioneering work "Proposed Correlation of Data for Isothermal Two Phase, Two Component Flow in Pipes" by R.W. Lockhart and R.C. Martinelli is upon us. Published in 1949 in the journal *Chemical Engineering Progress*, this seminal contribution has been cited over 1800 times in Web of Science publications and over 3600 times in Google Scholar publications. Nearly every paper dealing with modelling of two phase flow in pipes and channels begins with a citation of this landmark paper. More often than not, it is simply a starting point, as many authors feel obligated in some way to mention the contribution of Lockhart and Martinelli. In other cases, it is the foundation of new or modified analysis begin reported. While there is a clear understanding of the ultimate outcome of their pioneering work, few really appreciate the true magnitude of their accomplishment. This publication accomplished much more than is often reported. Given its legacy in fluids research it is important honor its contributions. This talk will discuss the obvious and less obvious implications of this classic work on two phase flow modelling.

Biography: Dr. Yuri Muzychka is currently Professor and Head of Mechanical Engineering at Memorial University of Newfoundland. He graduated from Memorial University in 1993 and then attended the University of Waterloo from 1993–1999 where he obtained a Masters of Applied Science (1995) and Ph.D. (1999) in Mechanical Engineering. From 1993 to 2000, he worked in the Microelectronics Heat Transfer Laboratory at the University of Waterloo on numerous problems in electronic packaging, heat exchangers, and fundamentals of heat transfer and fluid flow in internal flow. As a thermo-fluid analyst, his research is focused on the development of robust models for characterizing transport phenomena using fundamental theory. These models are validated using experimental and/or numerical results. He has published approximately 100 papers in refereed journals along with another 100 papers in international conference proceedings in these areas. He is also the lead author of three chapters published in the *CRC Microfluidics and Nanofluidics Handbook* (2012) and the *CRC Handbook of Fluid Dynamics* (2016). His research interests are in single and two phase micro- and minichannel flows, heat exchangers, enhanced heat transfer, thermal management in electronics packaging, and marine icing phenomena. In 2015 he became a Fellow of ASME.

KEYNOTE SPEAKER
TUESDAY, JUNE 25
7:45 AM–8:35 AM

Saeed Moghaddam,
University of Florida
"Microscale Physics of Phase Change Process: Answers to Century Old Questions and New Discoveries"

Abstract: Interfacial phase change process is a ubiquitous mechanism of heat transfer with numerous applications. The ebullition process at the solid-liquid interface triggers a set of complex conjugate heat and mass transfer events that dictate the thermal field. Although these processes have been studied for more than half a century, their physical nature is still plagued with large uncertainties. In this talk, new physical insight on the nature of heat and mass transfer events in phase change process are presented. The study is enabled through development of a new measurement tool that can resolve the surface thermal field with micrometers and microseconds spatial and temporal resolutions, respectively. Details of the different mechanisms of heat transfer including their time period of activation, area of influence, and magnitude will be discussed. The finding includes formation mechanisms of liquid films around bubbles that can be as thin as only a few microns and can form and evaporate in microseconds and milliseconds, respectively. In addition, a new paradigm for understanding and enhancing the maximum limit of heat flux from a solid surface, also known as critical heat flux (CHF), is discussed. The new approach involves altering the hydrodynamics of liquid and vapor flow above the surface such that they do not flow co-axially. Hence, a high velocity vapor flowing away from the surface does not prevent the liquid from reaching back to the surface. Under such conditions, velocity of the vapor phase no longer dictates the CHF limit. A significant implication of this change is that the fluid heat of vaporization no longer dictates the CHF limit; opening a pathway to a significant increase in CHF of fluids with a low heat of vaporization, with transformative impacts on boiling science and technology.

Biography: Dr. Saeed Moghaddam is Knox T. Millsaps Associate Professor in the Mechanical and Aerospace Engineering Department at the University of Florida. He received his PhD in Mechanical Engineering from the University of Maryland at College Park in 2006. Before joining the University of Florida in 2010, he was a postdoc in the Chemical and Biomolecular Engineering Department at UIUC (2007–2010). His academic background is in micro-/-nanoscale transport, interfacial science, micro-/-nanoengineering, and ionic liquid membrane-based absorption process. Dr. Moghaddam has made significant contributions in the field of phase-change heat transfer through invention of a new measurement technique that has enabled resolving the thermal field at the interface of a heated wall and a boiling liquid with unprecedented spatial and temporal resolutions. This work has led to addressing decades old fundamental questions regarding the underlying physics of the process at microscales. Dr. Moghaddam is also the inventor of semi-open absorption cycle that has been successfully tested in ORNL in 2017. He has developed the world's first membrane-based IL hybrid absorption cycle for energy efficient exchange of latent and sensible heats. Dr. Moghaddam's work on nanoengineered membranes and their transport characteristics has been highlighted in Nano Science and Technology Institute (NIST) Innovation Spotlight, *Nature Nanotechnology*, *New Scientist* magazine, *Heat Pumping Technologies Magazine* and 2010 Guinness World Records. His research is published in nearly 100 peer-reviewed papers, 14 patents, and one book chapter. Dr. Moghaddam's research has been supported by ARPA-A, DARPA, DOE, NSF, ONR, NIH, SRC, ORNL, and private companies.

Plenary & Keynote Presentations

PLENARY SPEAKER
TUESDAY, JUNE 25
2:00 PM–2:50 PM

Carolyn Ren,
University of Waterloo
"Towards Modular Droplet Microfluidic Systems: Tool for Combinatorial High Throughput Testing"

Abstract: Lab-on-a-Chip is a concept of integrating multiple chemical or biological assays that are usually performed using different facilities at traditional laboratories, into one single microfluidics platform. The droplet microfluidics platform utilizes nanoliter-sized drops as vesicles for reactions. These drops can be generated uniformly at kHz rates in microchannel networks by injecting one fluid (i.e., water) into another immiscible fluid (i.e., oil) making droplet microfliudics a powerful platform for high throughput analysis towards material synthesis, life science research, and drug discovery. The core of droplet microfluidics is the techniques for drop manipulation (generating, merging, splitting, trapping, sensing, and heating. This talk summarizes Ren's work on droplet microfluidics with a focus on the fundamental studies of droplet microfluidics, microwave sensing and heating, and active control of individual droplets.

Biography: Dr. Ren received her PhD in Mechanical Engineering at the University of Toronto. She is currently a professor of Mechanical and Mechatronics Engineering at the University of Waterloo (UW) and holds the Canada Research Chair in Droplet Microfluidics and Lab-on-a-Chip Technology. She is directing Waterloo Microfluidics Laboratory focusing on advancing fundamental knowledge of microfluidics and developing Lab-on-a-Chip technologies, which have significant impact on a wide range of applications such as material synthesis, protein separation, and water quality sensing. Besides the Canada Research Chair, Dr. Ren has also received several awards from the engineering and research community, including election as a Member of the College of New Scholars, Scientists and Artists of Royal Society of Canada, being recognized as one of 20 leading female innovators in Women of Innovation (Dr. Ren is a co-founder of two start-up companies), appointment as Fellow of the Canadian Society of Mechanical Engineering, Engineering Excellence from UW, and an Early Research Award from the Ontario Ministry of Research and Innovation.

KEYNOTE SPEAKER
TUESDAY, JUNE 25
7:45 AM–8:35 AM

Marc Hodes,
Tufts University
"Modeling Transport Phenomena in Diabatic Internal Flows in the Cassie State"

Abstract: Superhydrophobic surfaces (SHs) mimicking the behavior of, e.g., the lotus leaf by trapping lubricating gas beneath a liquid on a topologically rough surface are of scientific and engineering interest. Applications include reduced flow resistance in microfluidic conduits and enhanced microchannel cooling using liquid metal. Although the effects of heat transfer on droplets on SHs have received attention in the context of, e.g., enhanced dropwise condensation, comparatively little research on flows through diabatic SH microchannels has been conducted. We discuss the state of the art in modeling the coupled momentum, heat, and species transfer in such flows.

We formulate the complete convective transport problem for diabatic flow of liquid in the Cassie state over streamwise-oriented ridges and discuss the relevant physics. Then, we present a suite of solutions, many from the Red Lotus Project, a collaboration between mechanical engineers at Tufts University and mathematicians at Imperial College London. We first present the foundational solutions found by J.R. Philip in 1981 for the adiabatic problem. Next, we discuss those which capture the effects of phase change, thermocapillary stress, and curvature along menisci. Then, we discuss recent work in the literature that shows that even trace amounts of surfactants in the liquid can immobilize menisci. We then present a solution for the extended Graetz-Nusselt problem in the presence of viscous dissipation. Finally, we show how, by using a combination of asymptotics and a spectral numerical method, it is possible to solve the three-dimensional adiabatic problem to capture the effect of streamwise gradients in meniscus curvature on the Poiseuille number.

Biography: Marc Hodes earned his B.S., M.S., and Ph.D. degrees in mechanical engineering from the University of Pittsburgh, the University of Minnesota, and MIT, respectively. He spent 10 years at Bell Labs Research and has spent extended periods at the National Institute of Standards and Technologies (NIST), the University of Limerick, and Imperial College London. In 2008, he joined the Department of Mechanical Engineering at Tufts University, where he is a Professor. His research interests are in transport phenomena and, over the course of his career, four thematic areas have been addressed: 1) the thermal management of electronics, 2) mass transfer in supercritical fluids, 3) analysis of thermoelectric modules, and 4) analysis of convection in the presence of apparent slip. Current research focuses on transport phenomena in the presence of apparent slip, supercritical carbon dioxide-based drying of aerogels and multivariable optimization of the geometry of arrays of heat sinks.

Plenary & Keynote Presentations

PLENARY SPEAKER
WEDNESDAY, JUNE 26
8:00 AM–8:50 AM

Sushanta Mitra,
University of Waterloo
"Underliquid Wetting: Fundamentals and Applications"

Abstract: Wetting characteristics of a given substrate are of paramount importance for material discovery. We have developed a new method which allows us to characterize any underliquid substrate (superhydrophobic/superoleophobic) using needle-free drop deposition technique. We have also derived a new lubrication equation to characterize the coalescence behavior of two drops on underliquid substrates. Further, we demonstrate that for underliquid wetting of pillared substrates, there exists a metastable Cassie-Baxter state. Careful experiments conducted with oil drop in water and water drop in oil reveal the presence of a thin liquid layer between the drop and the submerged substrate, which accounts for the discrepancy between the experimental data and the theoretical predictions based on Young's equation. Finally, using the needle-free drop deposition technique, underwater superoleophobicity of a glass surface and fish scales are characterized and also development of a new underwater oleophobic surface is demonstrated.

Biography: Sushanta Mitra is the Executive Director of the Waterloo Institute for Nanotechnology and a Professor in Mechanical and Mechatronics Engineering and cross-appointed to the Departments of Physics & Astronomy and Chemical Engineering at the University of Waterloo. His research interests are in the fundamental understanding of fluid transport in micro- and nanoscale confinements with applications in energy, water, and bio-systems. For his contributions in engineering and sciences, he is an elected fellow of a number of key scientific organizations including the American Society of Mechanical Engineers, the Canadian Academy for Engineering, the Royal Society of Chemistry, the American Physical Society, and the American Association for the Advancement of Science. He is also the recipient of 2015 Engineering Excellence Medal from the Ontario Society of Professional Engineers.

KEYNOTE SPEAKER
WEDNESDAY, JUNE 26
8:50 AM–9:15 AM

Melanie Derby,
Kansas State University
"Multiphase Flows and Heat Transfer in the Food, Energy, Water Nexus"

Abstract: The sustainable production of food and power requires adequate fresh water, which is a critical focus of the Food, Energy, and Water nexus. Three thermal fluid projects in the Food, Energy, and Water nexus will be highlighted in this talk. Altered wettability to reduce soil evaporation is under current investigation. In the Food-Water nexus, evaporation results are presented for hydrophobic and hydrophilic soil pores and packed beds; hydrophobicity extends evaporation times. Due to the importance of capillary action, X-ray imaging is used to determine transient evaporation fronts for glass and Teflon-coated glass beads. Since heat transfer is critical for power production, two projects in the Energy-Water nexus will be presented. Flow visualizations and heat transfer data will demonstrate that dropwise flow condensation in the presence of nitrogen can mitigate the deleterious effects of noncondensables. Experimental and simulations demonstrating the impacts of vibrations and water quality on droplet motion will be discussed, with applications towards harvesting water from cooling towers.

Biography: Dr. Melanie Derby graduated from Rensselaer Polytechnic Institute with a B.S. in 2008, M.S. in 2010, and Ph.D. in 2013. In 2013, she joined Kansas State University where she studies multiphase flows and heat transfer. She is currently an Assistant Professor and holds the Hal and Mary Siegele Professorship in Engineering. Her research has been sponsored by NSF, NASA, ASHRAE, and industry. She is a recipient of a 2017 NSF CAREER Award, 2017 KSU College of Engineering Outstanding Assistant Professor Award, and 2017 ASME International Conference on Nanochannels, Microchannels, and Minichannels (ICNMM) Outstanding Early Career Award. She currently directs the KSU NRT, which is focused on interdisciplinary FEW research and graduate education.

Technical Sessions

MONDAY, JUNE 24

TRACK 1 SINGLE-PHASE FLOWS

1-1 SINGLE-PHASE FLOW
LEVEL 3, ST. JOHN'S CONVENTION CENTRE, CHURCHILL 1 10:45AM–12:15PM

10:45PM
Heat Transfer Investigation of an Additively Manufactured Minichannel Heat Exchanger

Technical Publication. ICNMM2019-4231

Hamidreza Rastan, Amir Abdi, Monika Ignatowicz, Bejan Hamawandi, *KTH Royal Institute of Technology, Stockholm, Stockholm, Sweden,* Poh Seng Lee, *National University of Singapore, Singapore, Singapore, Singapore,* Björn Palm, *KTH Royal Institute of Technology, Stockholm, Stockholm, Sweden*

11:15AM
Parametric Study of Vortex Generator Effects in an Additive Manufactured Minichannel Heat Exchanger

Technical Publication. ICNMM2019-4236

Hamidreza Rastan, *KTH Royal Institute of Technology, Stockholm, Stockholm, Sweden,* Tim Ameel, *University of Utah, Salt Lake City, UT, United States,* Björn Palm, *KTH Royal Institute of Technology, Stockholm, Stockholm, Sweden*

11:45AM
An Investigation of Enhanced Cooling Performance by Adopting Coolant Channel With Vortex Generator for High Voltage Direct Current

Technical Presentation. ICNMM2019-4263

Jaehyun Park, Jemun Choi, *Changwon National University, Changwon,* Chang Woo Han, *Hyosung Corporation, Anyang-Si, Korea (Republic),* Seung Bo Lee, *Hyosung Corporation, Anyang, Korea (Republic),* Heesung Park, *Changwon National University, Changwon, Korea (Republic)*

TRACK 13 BIOMEDICAL ENGINEERING IN MICROFLUIDICS

13-1 BIO AND BIOMEDICAL ENGINEERING
LEVEL 3, ST. JOHN'S CONVENTION CENTRE, CHURCHILL 2 10:45AM–12:15PM

10:45AM
Dissipative Particle Dynamics Study of Intracellular Delivery Into Capsule in Microfluidic Channels

Technical Presentation. ICNMM2019-4317

Nishanthi N S, Srikanth Vedantam, *Indian Institute of Technology Madras, Chennai, Tamil Nadu, India*

11:15AM
Mathematical Model of Nanoparticles Distribution in the Vitreous Humor: Study Case with Ex Vivo Bovine Eyes

Technical Presentation. ICNMM2019-4319

Anita Penkova, Anahid Khoobyar, Satwindar Sadhal, *University of Southern California, Los Angeles, CA, United States*

11:45AM
A Ghost Subdomain Boundary Element Formulation for Particulate Flow in Microchannels

Technical Presentation. ICNMM2019-4334

Alper Topuz, *Bilkent University, Ankara, Turkey,* Besim Baranoglu, *Atilim University, Ankara, Turkey,* Barbaros Cetin, *Bilkent University, Ankara, Turkey*

TRACK 6 INTERFACIAL PHENOMENA ON MICRO AND NANOENGINEERED SURFACES

6-1 INTERFACIAL PHENOMENA ON MICRO AND NANOENGINEERED SURFACES
LEVEL 3, ST. JOHN'S CONVENTION CENTRE, PIPPY 1 10:45AM–12:15PM

10:45AM
Fabrication and Corrosion Performance of a Superhydrophobic Stainless Steel Surface

Technical Publication. ICNMM2019-4209

Mona Amiriafshar, Xili Duan, Ali Nasiri, *Memorial University of Newfoundland, St. John's, NL, Canada*

11:07AM
A Qualitative Comparison Between Two Different Microfluidic Devices With Roughened Surfaces Based on Cavitation Inception

Technical Publication. ICNMM2019-4240

Morteza Ghorbani, Ece Ozdemir, Gokberk Deprem, *Sabanci University, Istanbul, Turkey,* L. Guillermo Villanueva, *EPFL, Lausanne, Switzerland,* Ali Kosar, *Sabanci University, Istarbul, Turkey*

11:29AM
The Leidenfrost Phenomenon on Aligned Si Nanowires

Technical Publication. ICNMM2019-4294

Manuel Auliano, *NTNU, Trondheim, Norway,* M. Fernandino, C.A. Dorao, *Norwegian University of Science and Technology, Trondheim, Norway*

11:51AM
Colloidal Particle Deposition in Microfluidic Systems Under Temperature Effects

Technical Presentation. ICNMM2019-4305

Chun Yang, *Nanyang Technological University, Singapore 639798, Singapore*

TRACK 2 TWO-PHASE FLOWS

2-3 TWO-PHASE FLOWS
LEVEL 3, ST. JOHN'S CONVENTION CENTRE, CHURCHILL 1 3:45PM–5:15PM

3:45PM
Review on Bubble Dynamics in Microchannel Heat Sinks

Technical Publication. ICNMM2019-4242

Sambaji Kadam, Ibrahim Hassan, *Texas A&M University at Qatar, Dohar, Qatar,* Ritunesh Kumar, *Indian Institute of Technology, Indore, Indore, India,* Aziz Rahman, *Texas A&M University at Qatar, Dohar, Qatar*

4:03PM
Development of a Hybrid Heat Sink for Thermal Management Of Photovoltaic Cells

Technical Publication. ICNMM2019-4244

Danish Rahman, Qatar, Ahmad Almomani, Ibrahim Hassan, Yasser Al Hamidi, Aziz Rahman, *Texas A&M University at Qatar, Dohar, Qatar*

4:21PM
Thermoreflectance Wall Temperature Measurement in Annular Two-Phase Flow

Technical Publication. ICNMM2019-4249

Jason Chan, Brian E. Fehring, Roman W. Morse, Kristofer Dressler, Gregory Nellis, *University of Wisconsin–Madison, WI, United States,* Evan Hurlburt, *Naval Nuclear Laboratory, West Mifflin, PA, United States,* Arganthaël Berson, *University of Wisconsin–Madison, Madison, WI, United States*

4:39PM
Analysis of Two-Phase Flow Characteristics in a Pulsating Heat Pipe

Technical Presentation. ICNMM2019-4289

Donna Cendana, *NASA Marshall Space Flight Center, Huntsville, AL, United States,* Takahiro Arai, *Central Research Institute of Electric Power Industries, Yokosuka, Kanagawa, Japan,* Masahiro Kawaji, *City College of New York, New York, NY, United States*

4:57PM
Flow Instability In Segmented Finned Microchannels with Different Flow Configurations

Technical Publication. ICNMM2019-4290

Sumit Raj, *Indian Institute of Technology, Patna, India*, Manabendra Pathak, *Indian Institute of Technology, Bihar, India,* Mohd. Kaleem Khan, *Indian Institute of Technology Patna, Patna, Bihar, India*

TRACK 4 CONDENSATION AND FREEZING

4-1 CONDENSATION AND FREEZING ON HEAT TRANSFER SURFACES
LEVEL 3, ST. JOHN'S CONVENTION CENTRE, CHURCHILL 2 3:45PM–5:15PM

3:45PM
A Compact Condenser for Thermal Desalination: Experimental Characterization and System Level Impact

Technical Publication. ICNMM2019-4252

Ramuel Safarkoolan, *University of California, Davis, Davis, CA, United States,* Xingsen Mu, *Dalian University of Technology, Dalian, China,* Vinod Narayanan, *Univ of California Davis, Davis, CA, United States*

4:03PM
Electrowetting-Induced Accelerated Dropwise Condensation of Moist Air

Technical Presentation. ICNMM2019-4278

Vaibhav Bahadur, *University of Texas at Austin, Austin, TX, United States*

4:21PM
Lubricant Redistribution and Nucleation Rate Density During Drop-Wise Condensation on Lubricant Infused Surfaces

Technical Presentation. ICNMM2019-4282

Vivek Vardhan Manepalli, Patricia B. Weisensee, *Washington University in St. Louis, St. Louis, MO, United States*

4:39PM
Optimization of Hybrid Hydrophilic-Hydrophobic Surfaces for Dropwise Condensation Enhancement

Technical Publication. ICNMM2019-4291

Giulio Croce, Paola D'Agaro, Nicola Suzzi, *University of Udine, Udine, UD, Italy*

4:57PM
Steam Flow Condensation in Mini-Channels With Sintered Copper Structures

Technical Presentation. ICNMM2019-4329

Gennifer A. Riley, Nicole Doughramaji, *Kansas State University, Manhattan, KS, United States,* Athul J. Pai, Munonyedi Egbo, Gisuk Hwang, *Wichita State University, Wichita, KS, United States,* Melanie Derby, *Kansas State University, Manhattan, KS, United States*

TRACK 7 CONJUGATE MICRO AND NANOSCALE HEAT TRANSFER

7-1 CONJUGATE MICRO AND NANOSCALE HEAT TRANSFER
LEVEL 3, ST. JOHN'S CONVENTION CENTRE, PIPPY 1 3:45PM–5:15PM

3:45PM
Numerical Simulation of Liquid-Liquid Taylor Flow With Heat Transfer

Technical Publication. ICNMM2019-4214

Marcel Kwakkel, M. Fernandino, C.A. Dorao, *Norwegian University of Science and Technology, Trondheim, Norway*

4:15PM
Flow Maldistribution Effects on the Temperature Uniformity in Double-Layered Microchannel Heat Sinks

Technical Publication. ICNMM2019-4284

Carlo Nonino, Stefano Savino, *University of Udine, Udine, Italy*

4:45PM
Investigations on a Nanofluid Cooled Variable Channel Width Single Layered Minichannel Heat Sink

Technical Publication. ICNMM2019-4303

Nirav Patel, Hemantkumar B. Mehta, *S. V. National Institute of Technology, Surat, India*

TUESDAY, JUNE, 25

LIGHTNING TALKS
LOBBY LEVEL, ST. JOHN'S CONVENTION CENTRE, BANNERMAN BALLROOM 2&4 8:35AM–9:05AM

TRACK 15 POSTER SESSION

15-1 POSTER SESSION PRESENTATION
LOBBY LEVEL, ST. JOHN'S CONVENTION CENTRE, FOYER 9:05AM–10:20AM

Session Organizer: Patricia B. Weisensee, *Washington University in St. Louis, Saint Louis, MO, United States*

Optimization of Flow Rate for Two-Phase Flow Using Artificial Intelligence

Poster Presentation. ICNMM2019-4212

Murtada Elhaj, *Memorial University, St. John's, NL, Canada*

Effect of pH Variation on Structural, Optical and Biomedical Applications of Cuo Thin Films

Poster Presentation. ICNMM2019-4232

Ranjith Kumar Easwaran, *Dr.N.G.P. Institute of Technology, Coimbatore, Tamilnadu, India*

Investigating the Pool Boiling Performance of Grooves Obtained Through Picosecond Laser Machining

Poster Presentation. ICNMM2019-4234

Udaya Kumar G, Hee Joon Lee, *Kookmin University, Seoul, Korea (Republic)*

Condensate Microdroplet Mobility on Lubricant-Infused Surfaces

Poster Presentation. ICNMM2019-4264

Jianxing Sun, Patricia B. Weisensee, *Washington University in St. Louis, St. Louis, MO, United States*

Assessment of Thermally-Actuated Pumping in an Open-Ended Channel with Multi-Scale Asymmetry in Surface Structure

Poster Presentation. ICNMM2019-4267

Ramuel Safarkoolan, Vinod Narayanan, *University of California Davis, Davis, CA, United States,* Sushil Bhavnani, *Auburn University, Auburn, AL, United States*

A Compact Condenser for Thermal Desalination: Experimental Characterization and System Level Impact

Poster Presentation. ICNMM2019-4268

Ramuel Safarkoolan, *University of California, Davis, Davis, CA, United States,* Xingsen Mu, *Dalian University of Technology, Dalian, China,* Vinod Narayanan, *University of California Davis, Davis, CA, United States*

Hybrid Cold Plate a Lightweight and Reliable Thermal Solution of High Power Density Electronics

Poster Presentation. ICNMM2019-4269

Muhammad Jahidul Hoque, Nithin Vinod Upot, Nenad Miljkovic, *University of Illinois at Urbana-Champaign, Urbana, IL, United States*

Lubricant Redistribution And Nucleation Rate Density During Drop-Wise Condensation on Lubricant Infused Surfaces

Poster Presentation. ICNMM2019-4283

Vivek Vardhan Manepalli, Patricia B. Weisensee, *Washington University in St. Louis, St. Louis, MO, United States*

Etched Metal Enhancements for Enhanced Refrigerant-Side Heat Transfer

Poster Presentation. ICNMM2019-4285

Nithin Vinod Upot, Allison J Mahvi, Nenad Miljkovic, *University of Illinois at Urbana-Champaign, Urbana, IL, United States*

Schotten-Baumann Reactions Using Flow Microreactors

Poster Presentation. ICNMM2019-4311

Aiichiro Nagaki, *Kyoto Unversity, Kyoto, Japan*

Fabrication and Characterization of Nylon 6 Gelatin Composite Nanofibers

Poster Presentation. ICNMM2019-4316

Kooshina Koosha, *Islamic Azad University / Engineering & Trading Co., Tehran, Islamic Republic of Iran*

A Low-Cost Microdispenser for General Analytical and Synthetic Applications

Poster Presentation. ICNMM2019-4318

Jagath Nikapitiya, Jagath Nikapitiya, Andrew Smith, *Memorial University of Newfoundland, St. John's, NL, Canada*

Dissipative Particle Dynamics Study of Intracellular Delivery Into Capsule in Microfluidic Channels

Poster Presentation. ICNMM2019-4327

Nishanthi N S, Srikanth Vedantam, *Indian Institute of Technology Madras, Chennai, Tamil Nadu, India*

Evaporation Rate Measurement at the Submicron Level Using Temperature-Sensitive Fluorescence Thermometry

Poster Presentation. ICNMM2019-4330

Youngjoon Suh, Cheng-Hui Lin, Yoonjin Won, *University of California, Irvine, Irvine, CA, United States*

Experimental Evaluation of a Circular-Shaped and Serpentine Liquid Cooling Device for Power Converting System

Poster Presentation. ICNMM2019-4331

Jaemun Choi, Jaehyun Park, *Changwon National University, Changwon, Korea (Republic),* Chang Woo Han, *Hyosung Corporation, Anyang-Si, Korea (Republic),* Heesung Park, *Changwon National University, Changwon, Korea (Republic)*

Microstructural Patterning of Self-Assembled Colloidal Particles

Poster Presentation. ICNMM2019-4335

Youngjoon Suh, Yoonjin Won, *University of California, Irvine, Irvine, CA, United States*

6-2 INTERFACIAL PHENOMENA ON MICRO AND NANOENGINEERED SURFACES
LEVEL 3, ST. JOHN'S CONVENTION CENTRE, CHURCHILL 1 10:20AM–11:50AM

10:20AM
On the Effect of Stochastic Si Nanowires on Water Droplet Evaporation

Technical Presentation. ICNMM2019-4225

Manuel Auliano, Damiano Auliano, *NTNU, Trondheim, Norway,* M. Fernandino, C.A. Dorao, *Norwegian University of Science and Technology, Trondheim, Norway*

10:38AM
Wickability and Wettability of Water Droplet on Stochastic Si Nanowires

Technical Presentation. ICNMM2019-4226

Damiano Auliano, *Norwegian University of Science and Technology, Trondheim, Norway,* Manuel Auliano, *NTNU, Trondheim, Norway,* M. Fernandino, C.A. Dorao, *Norwegian University of Science and Technology, Trondheim, Norway*

10:56AM
Experimental Study on Adsorbed Gas Molecules at the Graphite-Water Interface

Technical Presentation. ICNMM2019-4277

Hideaki Teshima, Yasuyuki Takata, Koji Takahashi, *Kyushu University, Fukuoka, Japan*

11:14AM
Jumping-Droplet-Induced Diffusion Boundary Layer Mixing

Technical Presentation. ICNMM2019-4287

Longnan Li, *University of Illinois Urbana-Champaign, Urbana, IL, United States,* Yukai Lin, Moonkyung Kim, Nenad Miljkovic, *University of Illinois at Urbana-Champaign, urbana, IL, United States*

11:32AM
Effect of Evaporation and Condensation On Nusselt Numbers in a Poiseuille Flow Over Structured Surfaces

Technical Presentation. ICNMM2019-4308

Lisa Lam, *Memorial University, Stow, MA, United States,* Yuri S Muzychka, *Memorial University of Newfoundland, St. John's, NL, Canada*

4-2 CONDENSATION AND FREEZING
LEVEL 3, ST. JOHN'S CONVENTION CENTRE, PIPPY 1 10:20AM–11:50AM

10:20AM
Passive Anti-Frosting Cables via Microscopic Ice Patterns

Technical Presentation. ICNMM2019-4255

Lance H. De Koninck, S. Farzad Ahmadi, Jonathan B. Boreyko, *Virginia Tech, Blacksburg, VA, United States* **10:42AM**
Arrested Dynamics of Droplet Impact on Icy Surfaces

Technical Presentation. ICNMM2019-4257

Andrew P. Fugaro, S. Farzad Ahmadi, Jonathan B. Boreyko, *Virginia Tech, Blacksburg, VA, United States*

11:04AM
Electronucleation With Metal Foams for Accelerating Synthesis of Tetrahydrofuran and Carbon Dioxide Hydrates

Technical Presentation. ICNMM2019-4321

Palash Acharya, Arjang Shahriari, Aritra Kar, *University of Texas, Austin, Austin, TX, United States,* Ashish Mhadeshwar, *Exxon Mobil Research and Engineering, Annandale, NJ, United States,* Vaibhav Bahadur, *University of Texas at Austin, Austin, TX, United States*

11:26AM
Melting Times of Ice Particles Impacting a Heated Water Bath

Technical Presentation. ICNMM2019-4322

Katherine Baskin, Patricia B. Weisensee, *Washington University in St. Louis, St. Louis, MO, United States*

TRACK 8 ELECTROKINETIC AND DIELECTROPHORETIC PHENOMENA

8-1 ELECTROKINETIC AND DIELECTROPHORETIC PHENOMENA
LEVEL 3, ST. JOHN'S CONVENTION CENTRE, CHURCHILL 2 10:20AM–11:50AM

10:20AM
Enhancement of Electrophoretic Mobility of Microparticles Near a Solid Wall: Experimental Verification

Technical Presentation. ICNMM2019-4304

Chun Yang, *Nanyang Technological University, Singapore, Singapore*

11:05AM
Improving the Carbon Dioxide Separation From Ultra-Dilute Near-Ambient Air Utilizing the Dielectrophoretic Effect and Infra-Red Induced Polarization

Technical Presentation. ICNMM2019-4323

Wael Itani, *American University of Beirut, Beirut, Lebanon*

2-2 TWO-PHASE FLOWS
LEVEL 3, ST. JOHN'S CONVENTION CENTRE, CHURCHILL 1 3:30PM–5:00PM

3:30PM
An Approximate Method for Analysis of Laminar Heat Transfer of Liquid-Liquid Taylor Flows in Mini Scale Tubing

Technical Publication. ICNMM2019-4217

Khalifa Alrbee, Yuri S Muzychka, Xili Duan, *Memorial University of Newfoundland, St. John, NL, Canada*

4:00PM
Pressure Drop in Liquid-Liquid Taylor Flow in Mini Scale Coiled and Curved Tubing

Technical Publication. ICNMM2019-4219

Wesam Adrugi, Yuri S Muzychka, Kevin Pope, *Memorial University of Newfoundland, St. John's, NL, Canada*

4:30PM
Numerical Study on Gas-Yield Power-Law Fluid in T-Junction Minichannel

Technical Publication. ICNMM2019-4253

Abdalsalam Ihmoudah, *Memorial University of Newfoundland, St. John's, NL, Canada,* M. M. Awad, *Mansoura University, Mansoura, Egypt,* Aziz Rahman, *Texas A&M University, Qatar, Qatar,* Stephen Butt, *Memorial University of Newfoundland, St. John's, NL, Canada*

1-2 SINGLE-PHASE FLOW
LEVEL 3, ST. JOHN'S CONVENTION CENTRE, CHURCHILL 2 3:30PM–5:00PM

3:30PM
Effect of Wall Compliance on Mixing Efficiency of Power-Law Fluid Flow in a Microchannel

Technical Presentation. ICNMM2019-4241

Shapour Jafargholinejad, *Azad University, Ardebil, Islamic Republic of Iran,* Tohid Alizadeh Bayancholi, *Turbo Ticaret Group, Istanbul, Turkey*

3:45PM
Thermal and Hydraulic study of Irregular Minichannels

Technical Publication. ICNMM2019-4246

Vishwajeetsinh Rahevar, Prayag Desai, Niraj Shah, *Nirma University, Ahmedabad, India,* Sheetal Pandya, Amit Arora, *Indian Institute of Technolgoy Gandhinagar, Gandhinagar, India*

4:00PM
Numerical Investigation on Roughness Element Effect on Mixing Performance in a Three Dimensional Passive Micromixer

Technical Presentation. ICNMM2019-4247

Shapour Jafargholinejad, *Azad University, Ardebil, Islamic Republic of Iran,* Reza Pir Khoshghiafe, *University of Tabriz, Ardebil, Islamic Republic of Iran,* Yasamin Zahedi, Parisa Sakkak Moghadam, *Azad University, Ardebil, Islamic Republic of Iran*

4:15PM
Effects of Channel Length and Chevron Angle on Pressure Drop in the Entrance Region of Corrugated Rib Channels

Technical Publication. ICNMM2019-4254

Mahmoud Hamoda, Kevin Pope, Yuri S. Muzychka, *Memorial University of Newfoundland, St. John's, NL, Canada*

4:30PM
Stability And Scalar Transport In Laminar Non-Newtonian Flow in a Bifurcating T-Junction

Technical Publication. ICNMM2019-4274

Ajay Chatterjee, *Santa Clara University and San Francisco State University, Santa Clara, CA, United States,* Fatemeh Khalkhal, *San Francisco State University, San Francisco, CA, United States*

4:45PM
Numerical Investigation of Heat Transfer and Single-Phase Flow in a Manifold Microchannel Heat Sink

Technical Presentation. ICNMM2019-4288

Xiaochen Lu, *Qian Xuesen Laboratory of Space Technology, Beijing, Beijing, China*

TRACK 12 CHEMICAL ENGINEERING IN MICROFLUIDICS

12-1 MICROFLUIDICS WITH CHEMICAL REACTIONS
LEVEL 3, ST. JOHN'S CONVENTION CENTRE, PIPPY 1 3:30PM–5:00PM

3:30PM
Non-Invasive Temperature Measurement for Polyimide-Based Microstructured Devices

Technical Publication. ICNMM2019-4207

Jens Bobers, Felix Reichmann, Jakob Zimmermann, Norbert Kockmann, *TU Dortmund University, Dortmund, Germany*

3:52PM
Development of a Manufacturing Process for Polyimide-Based Microstructured Devices Using Reactive Ion Etching

Technical Publication. ICNMM2019-4208

Jens Bobers, Maurice Hesselmann, Arndt-Christian Schneider, Jakob Zimmermann, Norbert Kockmann, *TU Dortmund University, Dortmund, Germany*

4:14PM
Design and Scale-up of Modular Capillary Helical Flow Inverter Reactors With Narrow Residence Time Distribution

Technical Publication. ICNMM2019-4237

Norbert Kockmann, Waldemar Krieger, Mira Schmalenberg, *TU Dortmund University, Dortmund, Germany*

4:36PM
Plasma effects on microbubble formation in gas-liquid interface across a microfluidic plasma reactor

Technical Presentation. ICNMM2019-4332

Oladayo Ogunyinka, Hemaka Bandulasena, *Loughborough University, Loughborough, Leicestershire, United Kingdom*

WEDNESDAY, JUNE, 26

TRACK 11 TRANSPORT IN ENERGY SYSTEMS

11-1 TRANSPORT IN ENERGY SYSTEMS
LEVEL 3, ST. JOHN'S CONVENTION CENTRE, CHURCHILL 1 9:30AM–11:00AM

9:30AM
Fabrication and Characterization of a Phase Change Based Thermal Switch

Technical Presentation. ICNMM2019-4325

Tanya Liu, *Stanford University, Stanford, CA, United States,* James Palko, *University of California Merced, Merced, CA, United States,* Joseph Katz, *Stanford University, Stanford, CA, United States,* Ercan Dede, Feng Zhou, *Toyota Research Institute of North America, Ann Arbor, MI, United States,* Mehdi Asheghi, Kenneth Goodson, *Stanford University, Stanford, CA, United States*

9:52AM
Comparing Three Methods for Waste Natural Gas-Based Water Production: Reverse Osmosis, Thermal Desalination, and Atmospheric Water Harvesting

Technical Presentation. ICNMM2019-4280

Vaibhav Bahadur, *University of Texas at Austin, Austin, TX, United States*

10:14AM
Analysis of Concentrator Photovoltaic/Microchannel Heat Sink System Using Nanofluid

Technical Publication. ICNMM2019-4256

Ali Radwan, M. M. Awad, *Mansoura University, Mansoura, Egypt,* Shinichi Ookawara, *Tokyo Institute of Technology, Tokyo, Japan,* Mahmoud Ahmed, *Assiut University, Assiut, Egypt*

10:36AM
Inverted Flows in Mini-Channel, Oil-Water Flow Regimes due to Wall Hydrophobicity

Technical Presentation. ICNMM2019-4328

Gennifer A. Riley, Kevin K. Bultongez, Melanie Derby, *Kansas State University, Manhattan, KS, United States*

TRACK 5 EVAPORATION, THIN FILM, AND SURFACE TENSION DRIVEN FLOWS

5-1 EVAPORATION, THIN FILM, AND SURFACE TENSION DRIVEN FLOWS
LEVEL 3, ST. JOHN'S CONVENTION CENTRE, CHURCHILL 2 9:30AM–11:00AM

9:30AM
Condensate Microdroplet Mobility on Lubricant-Infused Surfaces

Technical Presentation. ICNMM2019-4220

Jianxing Sun, Patricia B. Weisensee, *Washington University in St. Louis, St. Louis, MO, United States*

9:48AM
Falling Film Evaporation of HFO-1233zd(E) in Vertical Rectangular Minichannels Consisting of Serrated-Fins

Technical Publication. ICNMM2019-4221

Junichi Ohara, *National Fisheries University, Shimonoseki, Yamaguchi, Japan*

10:06AM
Water Harvesting With Large Synthetic Trees

Technical Presentation. ICNMM2019-4258

Weiwei Shi, Richard M. Dalrymple, Collin J. McKenny, David S. Morrow, Ziad T. Rashed, Daniel A. Surinach, Lance H. De Koninck, Julia L. O'Brien, Jonathan B. Boreyko, *Virginia Tech, Blacksburg, VA, United States*

10:24AM
Wettability Measurements During Electrostatic Suppression of the Leidenfrost State

Technical Presentation. ICNMM2019-4279

Vaibhav Bahadur, *University of Texas at Austin, Austin, TX, United States*

10:42AM
Etched Metal Enhancements for Enhanced Refrigerant-Side Heat Transfer

Technical Presentation. ICNMM2019-4281

Nithin Vinod Upot, Allison J. Mahvi, Nenad Miljkovic, *University of Illinois at Urbana-Champaign, Urbana, IL, United States*

2-1 TWO-PHASE FLOWS
LEVEL 3, ST. JOHN'S CONVENTION CENTRE, CHURCHILL 1 11:15AM–12:45PM

11:15AM
Investigation of Multiphase Interfaces in Small Channels Using Micro Ct

Technical Publication. ICNMM2019-4203

Julia Schuler, Norbert Kockmann, *TU Dortmund University, Dortmund, Germany*

11:37AM
The 70th Anniversary of the Lockhart-Martinelli Model for Two Phase Flow in Pipes

Technical Presentation. ICNMM2019-4213

Yuri S Muzychka, *Memorial University of Newfoundland, St. John's, NL, Canada*

11:59AM
Laminar Heat Transfer for Gas-Liquid Segmented (Taylor) Flow in Circular Ducts with Constant Wall Temperature

Technical Publication. ICNMM2019-4216

Khalifa Alrbee, Yuri S Muzychka, Xili Duan, *Memorial University of Newfoundland, St. John's, NL, Canada*

12:21PM
Numerical Simulation Study of Cryogenic Capillary Flow Behaviors and Phase Distribution Characteristics in Space

Technical Presentation. ICNMM2019-4233

Rong Ma, Wei Yao, Xiaochen Lu, Chao Wang, *Qian Xuesen Laboratory of Space Technology, Beijing, Beijing, China*

TRACK 3 POOL BOILING

3-1 POOL BOILING
LEVEL 3, ST. JOHN'S CONVENTION CENTRE, CHURCHILL 2 11:15AM–12:45PM

11:15AM
High Heat Flux Dissipation Using Symmetric Dual-Taper Manifold in Pool Boiling

Technical Publication. ICNMM2019-4292

Aranya Chauhan, Satish Kandlikar, *Rochester Institute of Technology, Rochester, NY, United States*

11:37AM
Exceedingly Wickable Graphene Nanoplatelets (GNP) Coated Surfaces for Enhanced Pool Boiling Heat Transfer

Technical Presentation. ICNMM2019-4293

Aniket Rishi, Satish Kandlikar, *Rochester Institute of Technology, Rochester, NY, United States,* Anju Gupta, *Rochester Institute of Technology, West Henrietta, NY, United States*

11-2 TRANSPORT IN ENERGY SYSTEMS
LEVEL 3, ST. JOHN'S CONVENTION CENTRE, PIPPY 1 11:15AM–12:45PM

11:15AM
Additive Manufacturing of Hybrid Cold Plates to Enable Ultra-High Power Density Electronics

Technical Presentation. ICNMM2019-4250

Muhammad Jahidul Hoque, Nithin Vinod Upot, Nenad Miljkovic, *University of Illinois at Urbana-Champaign, Urbana, IL, United States*

11:45AM
Performance of Concentrator Photovoltaic Systems Integrated With Double Layer Microchannel Heat Sink

Technical Publication. ICNMM2019-4259

Ali Radwan, M. M. Awad, *Mansoura University, Mansoura, Egypt,* Shinichi Ookawara, *Tokyo Institute of Technology, Tokyo, Japan,* Mahmoud Ahmed, *Assiut University, Assiut, Egypt*

12:15PM
Enhanced Liquid Water Removal From PEM Fuel Cell Flow Channels by Superimposing Acoustic Pressure Wave on Air Flow

Technical Publication. ICNMM2019-4295

Mehdi Mortazavi, Anthony Santamaria, Jingru Benner, Vedang Chauhan, *Western New England University, Springfield, MA, United States*

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Acharya	Palashw	Condensation and Freezing	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Pippy 1	4-2	ICNMM2019-4321
Adrugi	Wesam	Two-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 1	2-2	ICNMM2019-4219
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		Condensation and Freezing	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Pippy 1	4-2	ICNMM2019-4257
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		Transport in Energy Systems	Wednesday, June 26, 2019	11:15 AM–12:45 PM	Level 3, St. John's Convention Centre, Pippy 1	11-2	ICNMM2019-4259
Al Hamidi	Yasser	Two-Phase Flows	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 1	2-3	ICNMM2019-4244
Alizadeh Bayancholi	Tohid	Single-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 2	1-2	ICNMM2019-4241
Almomani	Ahmad	Two-Phase Flows	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 1	2-3	ICNMM2019-4244
Alrbee	Khalifa	Two-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 1	2-2	ICNMM2019-4217
Alrbee	Khalifa	Two-Phase Flows	Wednesday, June 26, 2019	11:15 AM–12:45 PM	Level 3, St. John's Convention Centre, Churchill 1	2-1	ICNMM2019-4216
Ameel	Tim	Single-Phase Flows	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Churchill 1	1-1	ICNMM2019-4236
Amiriafshar	Mona	Interfacial Phenomena on Micro and Nanoengineered Surfaces	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Pippy 1	6-1	ICNMM2019-4209
Arai	Takahiro	Two-Phase Flows	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 1	2-3	ICNMM2019-4289
Arora	Amit	Single-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 2	1-2	ICNMM2019-4246
Asheghi	Mehdi	Transport in Energy Systems	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 1	11-1	ICNMM2019-4325
Auliano	Damiano	Interfacial Phenomena on Micro and Nanoengineered Surfaces	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Churchill 1	6-2	ICNMM2019-4225
		Interfacial Phenomena on Micro and Nanoengineered Surfaces	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Churchill 1	6-2	ICNMM2019-4226
Auliano	Manuel	Interfacial Phenomena on Micro and Nanoengineered Surfaces	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Pippy 1	6-1	ICNMM2019-4294
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		Transport in Energy Systems	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 1	11-1	ICNMM2019-4256
		Transport in Energy Systems	Wednesday, June 26, 2019	11:15 AM–12:45 PM	Level 3, St. John's Convention Centre, Pippy 1	11-2	ICNMM2019-4259
Bahadur	Vaibhav	Condensation and Freezing	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 2	4-1	ICNMM2019-4278
		Condensation and Freezing	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Pippy 1	4-2	ICNMM2019-4321
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		Transport in Energy Systems	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 1	11-1	ICNMM2019-4280
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Baranoglu	Besim	Biomedical Engineering in Microfluidics	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Churchill 2	13-1	ICNMM2019-4334
Baskin	Katherine	Condensation and Freezing	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Pippy 1	4-2	ICNMM2019-4322
Benner	Jingru	Transport in Energy Systems	Wednesday, June 26, 2019	11:15 AM–12:45 PM	Level 3, St. John's Convention Centre, Pippy 1	11-2	ICNMM2019-4295
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Bhavnani	Sushil	Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4267
Bobers	Jens	Chemical Engineering in Microfluidics	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Pippy 1	12-1	ICNMM2019-4207
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Boreyko	Jonathan B.	Condensation and Freezing	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Pippy 1	4-2	ICNMM2019-4255
		Condensation and Freezing	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Pippy 1	4-2	ICNMM2019-4257
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Bultongez	Kevin K.	Transport in Energy Systems	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 1	11-1	ICNMM2019-4328
Butt	Stephen	Two-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 1	2-2	ICNMM2019-4253
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Chatterjee	Ajay	Single-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 2	1-2	ICNMM2019-4274
Chauhan	Aranya	Pool Boiling	Wednesday, June 26, 2019	11:15 AM–12:45 PM	Level 3, St. John's Convention Centre, Churchill 2	3-1	ICNMM2019-4292
Chauhan	Vedang	Transport in Energy Systems	Wednesday, June 26, 2019	11:15 AM–12:45 PM	Level 3, St. John's Convention Centre, Pippy 1	11-2	ICNMM2019-4295
Choi	Jemun	Single-Phase Flows	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Churchill 1	1-1	ICNMM2019-4263
Choi	Jaemun	Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4331
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D'Agaro	Paola	Condensation and Freezing	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 2	4-1	ICNMM2019-4291
Dalrymple	Richard M.	Evaporation, Thin Film, and Surface Tension Driven Flows	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 2	5-1	ICNMM2019-4258
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Dede	Ercan	Transport in Energy Systems	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 1	11-1	ICNMM2019-4325
Deprem	Gokberk	Interfacial Phenomena on Micro and Nanoengineered Surfaces	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Pippy 1	6-1	ICNMM2019-4240
Derby	Melanie	Condensation and Freezing	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 2	4-1	ICNMM2019-4329
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Desai	Prayag	Single-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 2	1-2	ICNMM2019-4246
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Dressler	Kristofer	Two-Phase Flows	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 1	2-3	ICNMM2019-4249
Duan	Xili	Two-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 1	2-2	ICNMM2019-4217
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		Conjugate Micro and Nanoscale Heat Transfer	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Pippy 1	7-1	ICNMM2019-4214
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Goodson	Kenneth	Transport in Energy Systems	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 1	11-1	ICNMM2019-4325
Gupta	Anju	Pool Boiling	Wednesday, June 26, 2019	11:15 AM–12:45 PM	Level 3, St. John's Convention Centre, Churchill 2	3-1	ICNMM2019-4293
Hamawandi	Bejan	Single-Phase Flows	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Churchill 1	1-1	ICNMM2019-4231
Hamoda	Mahmoud	Single-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 2	1-2	ICNMM2019-4254
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Ihmoudah	Abdalsalam	Two-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 1	2-2	ICNMM2019-4253
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Jafargholinejad	Shapour	Single-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 2	1-2	ICNMM2019-4241
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Kadam	Sambaji	Two-Phase Flows	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 1	2-3	ICNMM2019-4242
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Kar	Aritra	Condensation and Freezing	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Pippy 1	4-2	ICNMM2019-4321
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Kawaji	Masahiro	Two-Phase Flows	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 1	2-3	ICNMM2019-4289
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Khan	Mohd. Kaleem	Two-Phase Flows	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 1	2-3	ICNMM2019-4290
Khoobyar	Anahid	Biomedical Engineering in Microfluidics	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Churchill 2	13-1	ICNMM2019-4319
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		Chemical Engineering in Microfluidics	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Pippy 1	12-1	ICNMM2019-4207
		Chemical Engineering in Microfluidics	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Pippy 1	12-1	ICNMM2019-4208
		Chemical Engineering in Microfluidics	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Pippy 1	12-1	ICNMM2019-4237
Koosha	Kooshina	Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4316
Kosar	Ali	Interfacial Phenomena on Micro and Nanoengineered Surfaces	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Pippy 1	6-1	ICNMM2019-4240
Krieger	Waldemar	Chemical Engineering in Microfluidics	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Pippy 1	12-1	ICNMM2019-4237
Kumar	Ritunesh	Two-Phase Flows	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 1	2-3	ICNMM2019-4242
Kumar G	Udaya	Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4234
Kwakkel	Marcel	Conjugate Micro and Nanoscale Heat Transfer	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Pippy 1	7-1	ICNMM2019-4214
Lam	Lisa	Interfacial Phenomena on Micro and Nanoengineered Surfaces	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Churchill 1	6-2	ICNMM2019-4308
Lee	Hee Joon	Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4234
Lee	Poh Seng	Single-Phase Flows	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Churchill 1	1-1	ICNMM2019-4231
Lee	Seung Bo	Single-Phase Flows	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Churchill 1	1-1	ICNMM2019-4263
Li	Longnan	Interfacial Phenomena on Micro and Nanoengineered Surfaces	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Churchill 1	6-2	ICNMM2019-4287
Lin	Yukai	Interfacial Phenomena on Micro and Nanoengineered Surfaces	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Churchill 1	6-2	ICNMM2019-4287
Lin	Cheng-Hui	Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4330
Liu	Tanya	Transport in Energy Systems	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 1	11-1	ICNMM2019-4325
Lu	Xiaochen	Single-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 2	1-2	ICNMM2019-4288
		Two-Phase Flows	Wednesday, June 26, 2019	11:15 AM–12:45 PM	Level 3, St. John's Convention Centre, Churchill 1	2-1	ICNMM2019-4233
Ma	Rong	Two-Phase Flows	Wednesday, June 26, 2019	11:15 AM–12:45 PM	Level 3, St. John's Convention Centre, Churchill 1	2-1	ICNMM2019-4233
Mahvi	Allison J.	Evaporation, Thin Film, and Surface Tension Driven Flows	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 2	5-1	ICNMM2019-4281

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		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4285
Manepalli	Vivek Vardhan	Condensation and Freezing	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 2	4-1	ICNMM2019-4282
		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4283
McKenny	Collin J.	Evaporation, Thin Film, and Surface Tension Driven Flows	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 2	5-1	ICNMM2019-4258
Mehta	Hemantkumar B.	Conjugate Micro and Nanoscale Heat Transfer	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Pippy 1	7-1	ICNMM2019-4303
Mhadeshwar	Ashish	Condensation and Freezing	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Pippy 1	4-2	ICNMM2019-4321
Miljkovic	Nenad	Evaporation, Thin Film, and Surface Tension Driven Flows	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 2	5-1	ICNMM2019-4281
		Interfacial Phenomena on Micro and Nanoengineered Surfaces	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Churchill 1	6-2	ICNMM2019-4287
		Transport in Energy Systems	Wednesday, June 26, 2019	11:15 AM–12:45 PM	Level 3, St. John's Convention Centre, Pippy 1	11-2	ICNMM2019-4250
		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4269
		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4285
Morrow	David S.	Evaporation, Thin Film, and Surface Tension Driven Flows	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 2	5-1	ICNMM2019-4258
Morse	Roman W.	Two-Phase Flows	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 1	2-3	ICNMM2019-4249
Mortazavi	Mehdi	Transport in Energy Systems	Wednesday, June 26, 2019	11:15 AM–12:45 PM	Level 3, St. John's Convention Centre, Pippy 1	11-2	ICNMM2019-4295
Mu	Xingsen	Condensation and Freezing	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 2	4-1	ICNMM2019-4252
		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4268
Muzychka	Yuri S.	Single-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 2	1-2	ICNMM2019-4254
		Two-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 1	2-2	ICNMM2019-4217
		Two-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 1	2-2	ICNMM2019-4219
		Two-Phase Flows	Wednesday, June 26, 2019	11:15 AM–12:45 PM	Level 3, St. John's Convention Centre, Churchill 1	2-1	ICNMM2019-4213
		Two-Phase Flows	Wednesday, June 26, 2019	11:15 AM–12:45 PM	Level 3, St. John's Convention Centre, Churchill 1	2-1	ICNMM2019-4216

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		Interfacial Phenomena on Micro and Nanoengineered Surfaces	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Churchill 1	6-2	ICNMM2019-4308
N S	Nishanthi	Biomedical Engineering in Microfluidics	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Churchill 2	13-1	ICNMM2019-4317
		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4327
Nagaki	Aiichiro	Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4311
Narayanan	Vinod	Condensation and Freezing	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 2	4-1	ICNMM2019-4252
		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4267
		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4268
Nasiri	Ali	Interfacial Phenomena on Micro and Nanoengineered Surfaces	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Pippy 1	6-1	ICNMM2019-4209
Nellis	Gregory	Two-Phase Flows	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 1	2-3	ICNMM2019-4249
Nikapitiya	Jagath	Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4318
		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4318
Nonino	Carlo	Conjugate Micro and Nanoscale Heat Transfer	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Pippy 1	7-1	ICNMM2019-4284
O'Brien	Julia L.	Evaporation, Thin Film, and Surface Tension Driven Flows	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 2	5-1	ICNMM2019-4258
Ogunyinka	Oladayo	Chemical Engineering in Microfluidics	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Pippy 1	12-1	ICNMM2019-4332
Ohara	Junichi	Evaporation, Thin Film, and Surface Tension Driven Flows	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 2	5-1	ICNMM2019-4221
Ookawara	Shinichi	Transport in Energy Systems	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 1	11-1	ICNMM2019-4256
		Transport in Energy Systems	Wednesday, June 26, 2019	11:15 AM–12:45 PM	Level 3, St. John's Convention Centre, Pippy 1	11-2	ICNMM2019-4259
Ozdemir	Ece	Interfacial Phenomena on Micro and Nanoengineered Surfaces	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Pippy 1	6-1	ICNMM2019-4240
Pai	Athul J.	Condensation and Freezing	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 2	4-1	ICNMM2019-4329
Palko	James	Transport in Energy Systems	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 1	11-1	ICNMM2019-4325
Palm	Björn	Single-Phase Flows	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Churchill 1	1-1	ICNMM2019-4231

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		Single-Phase Flows	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Churchill 1	1-1	ICNMM2019-4236
Pandya	Sheetal	Single-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 2	1-2	ICNMM2019-4246
Park	Heesung	Single-Phase Flows	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Churchill 1	1-1	ICNMM2019-4263
		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4331
Park	Jaehyun	Single-Phase Flows	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Churchill 1	1-1	ICNMM2019-4263
		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4331
Patel	Nirav	Conjugate Micro and Nanoscale Heat Transfer	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Pippy 1	7-1	ICNMM2019-4303
Pathak	Manabendra	Two-Phase Flows	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 1	2-3	ICNMM2019-4290
Penkova	Anita	Biomedical Engineering in Microfluidics	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Churchill 2	13-1	ICNMM2019-4319
Pir Khoshghiafe	Reza	Single-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 2	1-2	ICNMM2019-4247
Pope	Kevin	Single-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 2	1-2	ICNMM2019-4254
		Two-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 1	2-2	ICNMM2019-4219
Radwan	Ali	Transport in Energy Systems	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 1	11-1	ICNMM2019-4256
		Transport in Energy Systems	Wednesday, June 26, 2019	11:15 AM–12:45 PM	Level 3, St. John's Convention Centre, Pippy 1	11-2	ICNMM2019-4259
Rahevar	Vishwajeetsinh	Single-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 2	1-2	ICNMM2019-4246
Rahman	Aziz	Two-Phase Flows	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 1	2-3	ICNMM2019-4242
		Two-Phase Flows	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 1	2-3	ICNMM2019-4244
		Two-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 1	2-2	ICNMM2019-4253
Rahman	Danish	Two-Phase Flows	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 1	2-3	ICNMM2019-4244
Raj	Sumit	Two-Phase Flows	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 1	2-3	ICNMM2019-4290
Rashed	Ziad T.	Evaporation, Thin Film, and Surface Tension Driven Flows	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 2	5-1	ICNMM2019-4258
Rastan	Hamidreza	Single-Phase Flows	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Churchill 1	1-1	ICNMM2019-4231

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		Single-Phase Flows	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Churchill 1	1-1	ICNMM2019-4236
Reichmann	Felix	Chemical Engineering in Microfluidics	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Pippy 1	12-1	ICNMM2019-4207
Riley	Gennifer A.	Condensation and Freezing	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 2	4-1	ICNMM2019-4329
		Transport in Energy Systems	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 1	11-1	ICNMM2019-4328
Rishi	Aniket	Pool Boiling	Wednesday, June 26, 2019	11:15 AM–11:37 AM	Level 3, St. John's Convention Centre, Churchill 2	3-1	ICNMM2019-4293
Sadhal	Satwindar	Biomedical Engineering in Microfluidics	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Churchill 2	13-1	ICNMM2019-4319
Safarkoolan	Ramuel	Condensation and Freezing	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 2	4-1	ICNMM2019-4252
		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4267
		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4268
Sakkak Moghadam	Parisa	Single-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 2	1-2	ICNMM2019-4247
Santamaria	Anthony	Transport in Energy Systems	Wednesday, June 26, 2019	11:15 AM–12:45 PM	Level 3, St. John's Convention Centre, Pippy 1	11-2	ICNMM2019-4295
Savino	Stefano	Conjugate Micro and Nanoscale Heat Transfer	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Pippy 1	7-1	ICNMM2019-4284
Schmalenberg	Mira	Chemical Engineering in Microfluidics	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Pippy 1	12-1	ICNMM2019-4237
Schneider	Arndt-Christian	Chemical Engineering in Microfluidics	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Pippy 1	12-1	ICNMM2019-4208
Schuler	Julia	Two-Phase Flows	Wednesday, June 26, 2019	11:15 AM–12:45 PM	Level 3, St. John's Convention Centre, Churchill 1	2-1	ICNMM2019-4203
Shah	Niraj	Single-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 2	1-2	ICNMM2019-4246
Shahriari	Arjang	Condensation and Freezing	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Pippy 1	4-2	ICNMM2019-4321
Shi	Weiwei	Evaporation, Thin Film, and Surface Tension Driven Flows	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 2	5-1	ICNMM2019-4258
Smith	Andrew	Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4318
Suh	Youngjoon	Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4330
		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4335
Sun	Jianxing	Evaporation, Thin Film, and Surface Tension Driven Flows	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 2	5-1	ICNMM2019-4220

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		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4264
Surinach	Daniel A.	Evaporation, Thin Film, and Surface Tension Driven Flows	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 2	5-1	ICNMM2019-4258
Suzzi	Nicola	Condensation and Freezing	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 2	4-1	ICNMM2019-4291
Takahashi	Koji	Interfacial Phenomena on Micro and Nanoengineered Surfaces	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Churchill 1	6-2	ICNMM2019-4277
Takata	Yasuyuki	Interfacial Phenomena on Micro and Nanoengineered Surfaces	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Churchill 1	6-2	ICNMM2019-4277
Teshima	Hideaki	Interfacial Phenomena on Micro and Nanoengineered Surfaces	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Churchill 1	6-2	ICNMM2019-4277
Topuz	Alper	Biomedical Engineering in Microfluidics	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Churchill 2	13-1	ICNMM2019-4334
Upot	Nithin Vinod	Evaporation, Thin Film, and Surface Tension Driven Flows	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 2	5-1	ICNMM2019-4281
		Transport in Energy Systems	Wednesday, June 26, 2019	11:15 AM–12:45 PM	Level 3, St. John's Convention Centre, Pippy 1	11-2	ICNMM2019-4250
		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4269
		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4285
Vedantam	Srikanth	Biomedical Engineering in Microfluidics	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Churchill 2	13-1	ICNMM2019-4317
		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4327
Villanueva	L. Guillermo	Interfacial Phenomena on Micro and Nanoengineered Surfaces	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Pippy 1	6-1	ICNMM2019-4240
Wang	Chao	Two-Phase Flows	Wednesday, June 26, 2019	11:15 AM–12:45 PM	Level 3, St. John's Convention Centre, Churchill 1	2-1	ICNMM2019-4233
Weisensee	Patricia B.	Condensation and Freezing	Monday, June 24, 2019	03:45 PM–05:15 PM	Level 3, St. John's Convention Centre, Churchill 2	4-1	ICNMM2019-4282
		Condensation and Freezing	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Pippy 1	4-2	ICNMM2019-4322
		Evaporation, Thin Film, and Surface Tension Driven Flows	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 2	5-1	ICNMM2019-4220
		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4264

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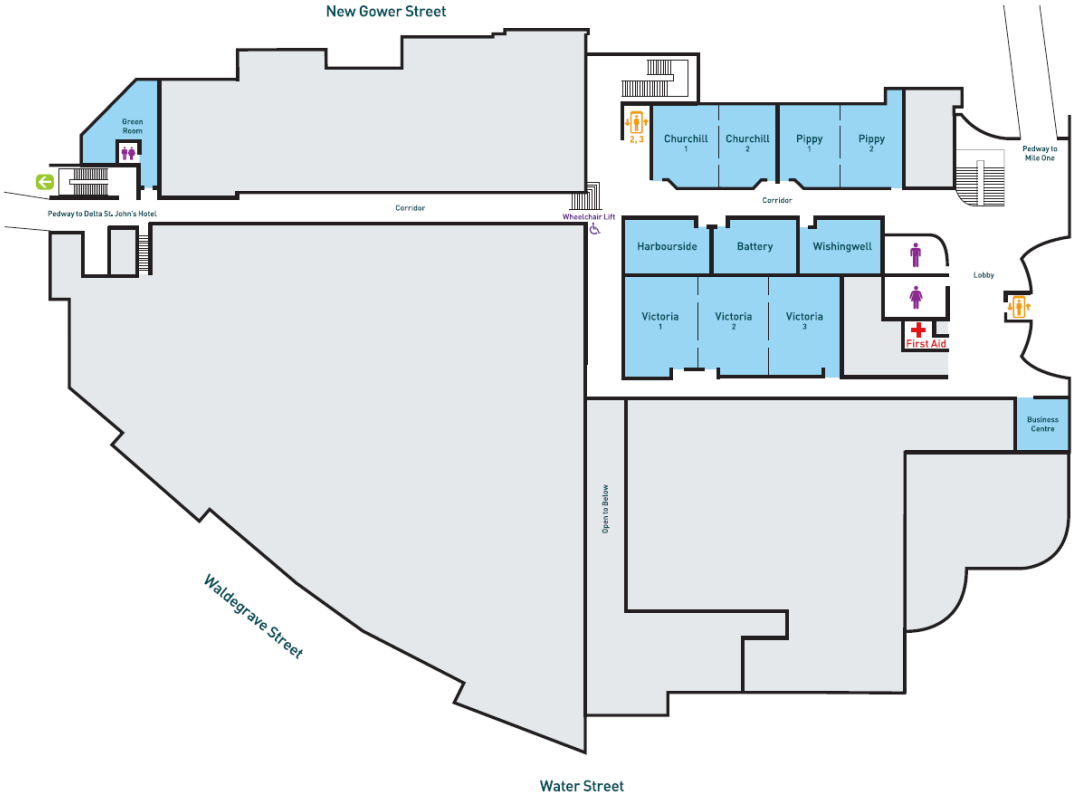
		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4283
Won	Yoonjin	Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4330
		Poster Session	Tuesday, June 25, 2019	08:35 AM–10:20 AM	Lobby Level, St. John's Convention Centre, Bannerman Ballroom 2&4	15-1	ICNMM2019-4335
Yang	Chun	Interfacial Phenomena on Micro and Nanoengineered Surfaces	Monday, June 24, 2019	10:45 AM–12:15 PM	Level 3, St. John's Convention Centre, Pippy 1	6-1	ICNMM2019-4305
		Electrokinetic and Dielectrophoretic Phenomena	Tuesday, June 25, 2019	10:20 AM–11:50 AM	Level 3, St. John's Convention Centre, Churchill 2	8-1	ICNMM2019-4304
Yao	Wei	Two-Phase Flows	Wednesday, June 26, 2019	11:15 AM–12:45 PM	Level 3, St. John's Convention Centre, Churchill 1	2-1	ICNMM2019-4233
Zahedi	Yasamin	Single-Phase Flows	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Churchill 2	1-2	ICNMM2019-4247
Zhou	Feng	Transport in Energy Systems	Wednesday, June 26, 2019	09:30 AM–11:00 AM	Level 3, St. John's Convention Centre, Churchill 1	11-1	ICNMM2019-4325
Zimmermann	Jakob	Chemical Engineering in Microfluidics	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Pippy 1	12-1	ICNMM2019-4207
		Chemical Engineering in Microfluidics	Tuesday, June 25, 2019	03:30 PM–05:00 PM	Level 3, St. John's Convention Centre, Pippy 1	12-1	ICNMM2019-4208

LOBBY LEVEL

LEVEL 3



Notes

Notes

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SAVE THE DATE

JULY 12–15, 2020

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