



**FFHMT** 8<sup>TH</sup> INTERNATIONAL CONFERENCE OF FLUID FLOW,  
2021 HEAT AND MASS TRANSFER (FFHMT'21)

**EHST** 5<sup>TH</sup> INTERNATIONAL CONFERENCE OF ENERGY  
2021 HARVESTING, STORAGE, AND TRANSFER (EHST'21)

May 21 - May 23, 2021| ~~Niagara Falls, Canada~~| Virtual Conference

**FFHMT'21 &  
EHST'21**

**May 22**

**May 23**

**OUR PROGRAM SCHEDULE IS BASED ON EASTERN TIME  
(ET - OTTAWA TIME)**

# FFHMT'21 & EHST'21

Registrants from the two conferences are permitted and encouraged to attend sessions from any of the two conferences.

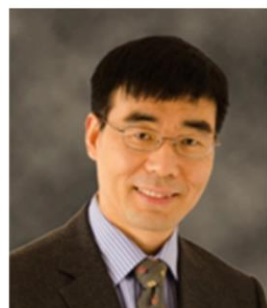
## FFHMT'21 & EHST'21 Scientific Committee Chair



**Dr. Boguslaw Kruczek**

University of Ottawa, Canada  
Conference Chair

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**Dr. Xianshe Feng**

University of Waterloo, Canada  
Conference Co-Chair

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**Dr. Wael H. Ahmed**

University of Guelph, Canada  
Technical Program Chair

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# MAY 22

<b>8:00 AM - 9:00 AM</b>	<b>Registrations</b>
<b>9:00 AM - 9:10 AM</b>	<b>Official Opening</b>
	<b>Dr. Boguslaw Kruczek, University of Ottawa, Canada</b>
<b>9:10 AM – 09:55 AM</b>	<b>FFHMT'21 KEYNOTE LECTURE</b>
	<b>The Temperature Decomposition Method for Simulating Periodic Thermal Flows Dr. Junfeng Zhang, Laurentian University, Canada</b>
<b>09:55 AM - 10:40 AM</b>	<b>FFHMT'21 KEYNOTE LECTURE</b>
	<b>Scalable Low-Carbon Hydrogen Production Technology Utilizing Waste/Process Heat Dr. Kamiel Gabriel, Ontario Tech University, Canada</b>
<b>10:40 AM - 10:50 AM</b>	<b>Break</b>
<b>10:50 AM - 12:05 PM</b>	<b>SESSION <u><a href="#">CFD I</a></u></b>
<b>12:05 PM - 12:10 PM</b>	<b>Break</b>
<b>12:10 PM - 01:15 PM</b>	<b>SESSION <u><a href="#">CFD II</a></u></b>

# MAY 22

**1:15 PM - 1:35 PM**

**Lunch Break**

**1:35 PM - 2:20 PM**

**FFHMT'21 KEYNOTE LECTURE**

**Cooling of High Power Generation Systems:  
Matching Demands with Supplies across the  
Length and Time Scales**

**Dr. Andrei Fedorov, Georgia Institute of  
Technology, USA**

**2:20 PM - 3:05 PM**

**EHST'21 KEYNOTE LECTURE**

**Analysis and Optimization of Wind Farm  
Performances**

**Dr. Stefano Leonardi, University of Alberta,  
Canada**

**3:05 PM - 3:15 PM**

**Break**

**3:15 PM - 3:45 PM**

**Session**  
**Combustion**

**3:45 PM - 3:50 PM**

**Break**

**3:50 PM - 5:10 PM**

**Session**  
**Energy Conversion and Storage**

# FFHMT'21 KEYNOTE LECTURE

MAY 22 | 9:10 AM - 09:55 AM | SESSION CHAIR: DR. BOGUSLAW KRUCZEK, UNIVERSITY OF OTTAWA, CANADA



**Titles:** The Temperature Decomposition Method for Simulating Periodic Thermal Flows

Dr. Junfeng Zhang, Laurentian University, Canada

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Dr. Junfeng Zhang obtained his Ph.D. degree in Mechanical Engineering from University of Alberta (Edmonton, Canada) in 2005. He then worked in the Department of Biomedical Engineering at Johns Hopkins School of Medicine (Baltimore, USA) for two years as a NSERC postdoctoral fellow. Dr. Zhang joined the Laurentian Engineering School in 2007 and was promoted to Full Professor in 2016. His research mainly focuses on computational modeling and numerical investigations of microscopic complex flows. Relevant research topics include heat and mass transfer, porous and particulate flows, the lattice Boltzmann method, microscopic blood flows, nanofluids and microfluidics. He is the author/co-author of more than 60 articles in peer-reviewed journals.

# FFHMT'21 KEYNOTE LECTURE

MAY 22 | 9:55 AM - 10:40 AM | SESSION CHAIR: DR. BOGUSLAW KRUCZEK, UNIVERSITY OF OTTAWA, CANADA



**Titles:** Scalable Low-Carbon Hydrogen Production Technology Utilizing Waste/Process Heat  
Dr. Kamiel Gabriel, Ontario Tech University, Canada

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Dr. Gabriel is an elected member of the Canadian Academy of Engineering and the former A/Deputy Minister at the Ontario Ministry of Research and Innovation. In 1990, Dr. Gabriel attended the prestigious, MIT-founded, International Space University and received a diploma in Space Sciences. For over 14 years, Dr. Gabriel led an international team in the research efforts spearheaded by NASA to design, test and operate a thermal management system for the International Space Station (ISS). In 2004, Dr. Gabriel was invited to lead the development of the research and innovation ecosystem in a newly announced university. He assumed the position of the founding AVP research and graduate programs at Ontario Tech University (formerly known as University of Ontario Institute of Technology) in Ontario, Canada. Under his leadership, Ontario Tech University was ranked as one of the top Canadian higher learning institutions in the categories of innovation and leaders of tomorrow.

# SESSION

## CFD I

MAY 22 | 10:50 AM - 12:05 PM | SESSION CHAIR: DR. BOGUSLAW KRUCZEK, UNIVERSITY OF OTTAWA, CANADA AND DR. KAMIEL GABRIEL, ONTARIO TECH UNIVERSITY, CANADA

**Titles:** Modelling of Supersonic and Subsonic Flows Using Hybrid Pressure-Based Solver in Openfoam

**FFHMT 107**

**Time:** 10:50 - 11:05

**Presenter:** Rudra N. Roy, Indian Institute of Technology, Goa

**Authors:** Janhavi Gharate, Rudra N. Roy

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**Titles:** An Innovational, Collision Model and Data Set Generation at Novel Test-Rig for Validation of Numerical Model in the Frame of Machine Learning

**FFHMT 121**

**Time:** 11:05 - 11:20

**Presenter:** Agata Widuch, Silesian University of Technology, Poland

**Authors:** Agata Widuch, Marcin Nowak, Ziemowit Ostrowski, Adam Klimanek, Ryszard Białocki, Kari Myöhänen, Alessandro Parente and Wojciech Adamczyk

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**Titles:** Modelling of Heat Exchangers with Computational Fluid Dynamics

**FFHMT 127**

**Time:** 11:20 - 11:35

**Presenter:**Chamil Abeykoon, The University of Manchester, UK

**Authors:** Chamil Abeykoon

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# SESSION

## CFD I

MAY 22 | 10:50 AM - 12:05 PM | SESSION CHAIR: DR. BOGUSLAW KRUCZEK AND DR. POH SENG (PS) LEE

**Titles:** Computational Study on Wingtip Vertical Fluid Injection for Induced Drag Reduction

**FFHMT 135**

**Time:** 11:35 - 11:50

**Presenter:** Hariprasad Thimmegowda, Alliance University, India

**Authors:** Hariprasad Thimmegowda, Yadu Krishnan S, Gisa G S

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**Titles:** A CFD/DEM Approach to Determine the Flow Resistance of Randomly Packed Bed of Crushed Rock Particles

**FFHMT 140**

**Time:** 11:50 - 12:05

**Presenter:** Jaap Hoffmann, Stellenbosch University, South Africa

**Authors:** Jaap Hoffmann

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## SESSION

### CFD II

MAY 22 | 12:10 PM - 1:15 PM | SESSION CHAIR: DR. BOGUSLAW KRUCZEK, UNIVERSITY OF OTTAWA, CANADA AND DR. CHAMIL ABEEKOON, THE UNIVERSITY OF MANCHESTER, UK

**Titles:** Heat Transfer Augmentation Using Dissimilar Porous Baffles in a Backward-Facing Step Flow

**FFHMT 147**

**Time:** 12:10 - 12:25

**Presenter:** James Arthur, Bucknell University, United States

**Authors:** James Arthur

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**Titles:** Simulation of Metal Additive Manufacturing

**FFHMT 134**

**Time:** 12:25 - 12:40

**Presenter:** J. Angel Diosdado De la Pena, Youngstown State University, United States

**Authors:** J. Angel Diosdado De la Pena, Kyosung Choo

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**Titles:** Efficient Heating Strategies Based On Variable Set-Point Temperature of a Bus Cabin with No Air Recirculation

**FFHMT 136**

**Time:** 12:40 - 12:55

**Presenter:** Ehsan Afrasiabian, Queen's University Belfast, United Kingdom

**Authors:** Ehsan Afrasiabian, Roy Douglas, Gareth Cunningham , Marco Geron

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# SESSION

## CFD II

MAY 22 | 12:10 PM - 1:15 PM | SESSION CHAIR: DR. SAHBA SADIR, INSTITUTE FOR MICRO PROCESS ENGINEERING (IMVT)\_KIT, GERMANY

**Titles:** Numerical Study Of Three-Winged Passive Micromixer Based On Sar Principle

**FFHMT 120**

**Time:** 12:55 - 01:00

**Presenter:** Monther Jomha, University of Van Yuzuncu Yil, Turkey

**Authors:** Monther Jomha, Sedat Yayla

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**Titles:** Thermal Analysis of a 3U-Cubesat, a Case Study of Pakal Satellite

**FFHMT 137**

**Time:** 01:00 - 1:15

**Presenter:** Gabriel Salazar-Salinas, Universidad Panamericana, México

**Authors:** Gabriel Salazar-Salinas, Estefanía Botello-Ramírez, Edgar Avalos-Gauna

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# FFHMT'21 KEYNOTE LECTURE

MAY 22 | 1:35 PM - 2:20 PM | SESSION CHAIR: DR. WAEL H. AHMED, UNIVERSITY OF GUELPH, CANADA



**Titles:** Cooling of High Power Generation Systems: Matching Demands with Supplies across the Length and Time Scales

Dr. Andrei Fedorov, Georgia Institute of Technology, USA Keynote Speaker

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Andrei G. Fedorov is the Rae S. & Frank H. Neely Chair Professor in the School of Mechanical Engineering at Georgia Tech. His current research focuses on thermal management of high performance electronics, and portable/distributed power generation with CO<sub>2</sub> capture, MEMS-enabled bioanalytical instrumentation, and electron-beam-mediated direct-write nanomanufacturing.

Dr. Fedorov's accomplishments have been recognized by peers, including the 2006 Banimir F. von Turkovich Outstanding Young Manufacturing Engineer Award from the Society of Manufacturing Engineers (SME) "for contributions and accomplishments in the manufacturing industry" and the 2007 Bergles-Rohsenow Award in Heat Transfer from the American Society of Mechanical Engineers (ASME) for "sustained contribution to heat, mass, and radiation transfer." Most recently, Dr. Fedorov has been selected to become a recipient of the 2010 Gustus L. Larson Memorial Award, given jointly by Pi Tau Sigma (International Mechanical Engineering Honor Society) and the ASME, in recognition of outstanding achievements in mechanical engineering within ten to twenty years following graduation. Dr. Fedorov authored/co-authored over 200 archival articles published in premier technical journals and refereed conference/symposia proceedings, along with numerous invited and keynote presentations at the major national and international conferences. He is a member of International Advisory Board of the Tokyo Tech's Global Center of Excellence for Energy Science; serves on Editorial Advisory Boards of the Nanoscale & Microscale Thermophysical Engineering, the International Journal of Multiscale Computational Engineering, International Journal of Interfacial Phenomena and Heat Transfer, Journal of Nanoelectronics and Optoelectronics, and Transactions of the Japanese Society of Mechanical Engineers (JSME); and consults a number of government agencies and major corporations worldwide.

# EHST'21 KEYNOTE LECTURE

MAY 22 | 2:20 PM - 3:05 PM | SESSION CHAIR: DR. WAEL H. AHMED, UNIVERSITY OF GUELPH, CANADA



**Titles:** Analysis and Optimization of Wind Farm Performances

Dr. Stefano Leonardi, The University of Texas at Dallas, USA

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Stefano Leonardi is a professor at the Department of Mechanical Engineering University of Texas at Dallas. He got a Master degree in Aeronautical Engineering (1999) and a PhD in Theoretical and Applied Mechanics (2002) at the University of Rome “La Sapienza”, Italy. He was Assistant Professor from 2006 to 2010 and Associate professor from 2010 to 2013 at the University of Puerto Rico at Mayaguez. He joined UTD in 2013. His research interests are in turbulent flows over rough walls, heat transfer, turbo-machinery, super-hydrophobic surfaces, wind turbines, cardiovascular flow, wildfire propagation and oceanography. Leonardi’s research has been funded by National Science Foundation, Office of Naval Research, National Institute of Health, American Heart Association, National Renewable Energy Laboratory, Pratt & Whitney and Argonne National Lab.

## SESSION

### COMBUSTION

MAY 22 | 3:15 PM - 3:45 PM | SESSION CHAIR: DR. WAEL H. AHMED, UNIVERSITY OF GUELPH, CANADA

**Titles:** Explosion Characteristics of Syngas/air Premixed Flames  
FFHMT 102

**Time:** 3:15 - 3:30

**Presenter:** Manh-Vu Tran, Monash University Malaysia, Malaysia

**Authors:** Manh-Vu Tran, Gianfranco Scribano

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**Titles:** Modeling Laser-Induced Incandescence of Soot Particles  
Produced In A Premixed  $\text{CH}_4/\text{O}_2/\text{N}_2$  Flat Flame

FFHMT 139

**Time:** 3:30 - 3:45

**Presenter:** Sébastien Menanteau, Environment & Materials Engineering, France

**Authors:** Sébastien Menanteau, Romain Lemaire

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## SESSION

### ENERGY CONVERSION AND STORAGE I

MAY 22 | 3:50 PM - 5:10 PM | SESSION CHAIR: DR. WAEL H. AHMED, UNIVERSITY OF GUELPH, CANADA AND DR. STEFANO LEONARDI, THE UNIVERSITY OF TEXAS AT DALLAS, USA

**Titles:** Epoxy Resin for Sealing the Underground Hydrogen Storage Reservoirs

**EHST 103**

**Time:** 3:50 - 3:55

**Presenter:** Dawid Gajda, Silesian University of Technology, Poland

**Authors:** Dawid Gajda

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**Titles:** Analysis of a Trombe Wall Prototype with Thermal Energy Storage and Air Vent Management

**EHST 107**

**Time:** 3:55 - 4:10

**Presenter:** Abdallah Alshantaf, York University, Canada

**Authors:** Abdallah Alshantaf, Harmeet Singh, Paul O'Brien

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**Titles:** The Energy Storage Business Model Within Electricity Companies  
**EHST 115**

**Time:** 4:10 - 4:25

**Presenter:** Juliana D'Angela Mariano, Federal University of Technology, Brazil

**Authors:** Juliana D'Angela Mariano, Patrícia Monteiro Barbosa de Freitas, Lúcio de eedeiros, Pedro Augusto Biasuz Block, Victor Baiochi Riboldi, Jair Urbanetz Junior

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## SESSION

### ENERGY CONVERSION AND STORAGE I

MAY 22 | 3:50 PM - 5:10 PM | SESSION CHAIR: DR. WAEL H. AHMED, UNIVERSITY OF GUELPH, CANADA AND DR. STEFANO LEONARDI, THE UNIVERSITY OF TEXAS AT DALLAS, USA

**Titles:** Battery Energy Storage System Integration in Photovoltaic Buildings: A Pilot Project in a Brazilian University

**EHST 112**

**Time:** 4:25 - 4:40

**Presenter:** Juliana D'Angela Mariano, Federal University of Technology, Paraná

**Authors:** Juliana D'Angela Mariano, Adriana Schilive de Souza, Jair Urbanetz Junior

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**Titles:** New Material and New Concepts Improve Hygroelectric Generator Output

**EHST 124**

**Time:** 4:40 - 4:55

**Presenter:** Diana Lermen, University of Campinas, Brazil

**Authors:** Diana Lermen, Leandra P. dos Santos, Fernando Galembeck

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**Titles:** Shaping the Future with Flexible, Wire-Shaped Supercapacitors

**EHST 120**

**Time:** 4:55 - 5:10

**Presenter:** Joe Sleppy

**Authors:** Joe Sleppy, Dr. Isaiah Oladeji

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# MAY 23

**9:00 AM - 09:45 AM      FFHMT'21 KEYNOTE LECTURE**

**Advanced Materials for High Performance Fuel Cells and Electrolyzers**

**Dr. Aimy Bazylak, University of Toronto, Canada**

**9:45 AM - 10:30 AM      FFHMT'21 KEYNOTE LECTURE**

**Single Phase Convective Heat Transfer Passive Enhancement: Techniques, Mechanisms, Performance Comparisons and Applications**

**Dr. Poh Seng (PS) Lee National University of Singapore (NUS), Singapore**

**10:30 AM - 10:40 AM      BREAK**

**10:40 AM - 11:10 AM      SESSION**

**Laminar And Turbulent Flows**

**11:10 AM - 11:15 AM      BREAK**

**11:15 AM - 12:15 PM      SESSION**

**Experimental Fluid Flow**

**12:15 PM - 12:25 PM      BREAK**

**12:25 PM - 12:55 PM      SESSION**

**Boiling and Condensation**

**12:55 PM - 01:05 PM      BREAK**

**01:05 PM - 01:35 PM      SESSION**

**Mass Transfer**

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# MAY 23

**01:35 PM - 01:55 PM    LUNCH BREAK**

**01:55 PM - 02:40 PM    EHST'21 KEYNOTE LECTURE**

[High-Performance Thin Film Composite  
Membranes for Energy Harvesting using  
Pressure Retarded Osmosis \(PRO\)](#)

**Dr. Mohtada Sadrzadeh, University of Alberta,  
Canada**

**02:40 PM - 03:40 PM    SESSION**

[Energy Conversion and Storage II](#)

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# FFHMT'21 KEYNOTE LECTURE

MAY 23 | 9:00 AM - 9:45 AM | SESSION CHAIR: DR. XIAN SHE FENG, UNIVERSITY OF WATERLOO, CANADA



**Titles:** Advanced Materials for High Performance Fuel Cells and Electrolyzers  
[Dr. Aimy Bazylak, University of Toronto, Canada](#)

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Prof. Aimy Bazylak is the Canada Research Chair in Thermofluids for Clean Energy and Professor in the Department of Mechanical and Industrial Engineering at the U of T. Her research is focused on advancing fuel cells, electrolyzers and batteries for clean power and energy storage in the absence of greenhouse gas emissions. She uses modelling and real-time imaging to design new materials for high efficiency and high-performance electrochemical energy conversion, and she has published 117 journal papers in her field. In 2011, she was awarded the I.W. Smith Award from the Canadian Society for Mechanical Engineering, and she received the Ontario Early Researcher Award in 2012. From 2015-2018, she served as the Director of the U of T Institute for Sustainable Energy. In 2015 she was named an Alexander Von Humboldt Fellow (Germany), and in 2019 she was named a Fellow of the American Society of Mechanical Engineers. In 2020, she was named a Helmholtz International Fellow (Germany), was awarded the U of T McLean Award, and was elected to the Royal Society of Canada College of New Scholars, Artists and Scientists.

# FFHMT'21 KEYNOTE LECTURE

MAY 23 | 9:45 AM - 10:30 AM | SESSION CHAIR: DR. XIANSHE FENG, UNIVERSITY OF WATERLOO, CANADA



**Titles:** Single Phase Convective Heat Transfer Passive Enhancement: Techniques, Mechanisms, Performance Comparisons and Applications

Dr. Poh Seng (PS) Lee, National University of Singapore (NUS), Singapore

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Dr. Poh Seng (PS) Lee is an ASME Fellow and Associate Professor of Mechanical Engineering at the National University of Singapore (NUS). He currently serves as the Deputy Executive Director of Energy Studies Institute, Director of Singapore Energy Centre, Director of Centre for Energy Research & Technology (CERT) and Programme Director of Cooling Energy Science & Technology Singapore (CoolestSG) national consortium. Prof Lee's research interests include high performance cooling techniques (in particular single and two-phase microchannel cooling), energy efficient air conditioning and low-grade waste heat recovery. He is the recipient of numerous research and innovation awards including 2013 NUS Faculty of Engineering's Young Faculty Research Award, 2011 Institution of Engineers Singapore (IES) Prestigious Engineering Achievement Award, 2011 Asia Pacific Clean Energy Summit Top 10 Defense Energy Technology Solutions Award and 2009 Tan Kah Kee Young Inventors Award (TKKYIA) – Defense Science. Prof Lee is passionate about translating R&D outcomes into innovations & enterprises and have founded CoolestDC Pte Ltd to commercialise his group's liquid cooling solution for sustainable tropical data centres.

## SESSION

### LAMINAR AND TURBULENT FLOWS

MAY 23 | 10:40 AM - 11:10 AM | SESSION CHAIR: DR. XIANSHE FENG, UNIVERSITY OF WATERLOO, CANADA

**Titles:** Bayesian Cluster Characterization and Classification for Direct Numerically Simulated Turbulence Features

**FFHMT 125**

**Time:** 10:40 - 10:45

**Presenter:** Nicholas V. Scott, Riverside Research, Open Innovation Center, Dayton Research Center, USA

**Authors:** Nicholas V. Scott, Jack McCarthy, Robert A. Handler

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**Titles:** Bayesian Structural Characterization and Classification for Direct Numerically Simulated Turbulence Features

**FFHMT 126**

**Time:** 10:45 - 10:50

**Presenter:** Nicholas V. Scott, Riverside Research, Open Innovation Center, Dayton Research Center, USA

**Authors:** Nicholas V. Scott, Jack McCarthy, Tian-Jian Hsu

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**Titles:** Bayesian Data Characterization and State Prediction for a Large Eddy Turbulent Flow Simulation: A Revisitation

**FFHMT 131**

**Time:** 10:50 - 10:55

**Presenter:** Nicholas V. Scott, Riverside Research, Open Innovation Center, Dayton Research Center, USA

**Authors:** Nicholas V. Scott, Jack McCarthy

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**Titles:** Turbulent Flow in an Annular Channel of Variable Cross-Section

**FFHMT 133**

**Time:** 10:55 - 11:10

**Presenter:** Vladimir Trifonov, Institute of Mechanics Lomonosov Moscow State, Russia

**Authors:** Vladimir Trifonov, Alexander Reshmin, Sergei Teplovodskii

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## SESSION

### EXPERIMENTAL FLUID FLOW

MAY 23 | 11:15 AM - 12:15 PM | SESSION CHAIR: DR. XIANSHE FENG, UNIVERSITY OF WATERLOO, CANADA

**Titles:** Investigation of Inverse Magnus Effect by Partial Circulation Control  
Elements: Experimental Design

**FFHMT 111**

**Time:** 11:15 – 11:30

**Presenter:** Acar Celik, Izmir Katip Celebi University Izmir, Turkey

**Authors:** Acar Celik, Sercan Acarer, Ian Jacobi, Beni Cukure

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**Titles:** Comparison of Experimental and Theoretical Characteristics of Linear Waves in the Submerged Air Jet

**FFHMT 138**

**Time:** 11:30 - 11:45

**Presenter:** Linar Gareev, Lomonosov Moscow State University, Russia

**Authors:** Linar Gareev, Anastasia Chicherina, Alexander Reshmin1, Vladimir Trifonov, Vasily Vedeneev, Julia Zayko

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**Titles:** High Subsonic Flow Field from the Serpentine Nozzle

**FFHMT 144**

**Time:** 11:45 - 12:00

**Presenter:** Abhijit Kushari, Punjab Engineering College, India

**Authors:** A Nageswara Rao, Rajat Arora, Abhijit Kushari

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**Titles:** Thermal Analysis of Latent Heat Thermal Energy Storage Systems Enhanced with Annular and Radial Fins

**FFHMT 116**

**Time:** 12:00 - 12:15

**Presenter:** Saeed Tiari, Gannon University, USA

**Authors:** Saeed Tiari, Addison Hockins, Samantha Moretti

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## SESSION

### BOILING AND CONDENSATION

MAY 23 | 12:25 PM - 12:55 PM | SESSION CHAIR: DR. JAAP HOFFMANN, STELLENBOSCH UNIVERSITY, SOUTH AFRICA

**Titles:** On Jet Impinging Boiling Heat Transfer

**FFHMT 104**

**Time:** 12:25 - 12:40

**Presenter:** Mahmoud A. Abdelfattah, McMaster University, Canada

**Authors:** Mahmoud A. Abdelfattah and Mohamed S. Hamed

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**Titles:** The Effect of Surface Vibration on Spray Evaporative Cooling

**FFHMT 129**

**Time:** 12:40 - 12:55

**Presenter:** Alireza Sarmadian, University of Sussex, UK

**Authors:** A. Sarmadian, J. F. Dunne<sup>1</sup>, C. A. Long, J-P Pirault, J. Thalackottore-Jose, Cedric Rouaud

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## SESSION

### MASS TRANSFER

MAY 23 | 1:05 PM - 1:35 PM | SESSION CHAIR: DR. SAEED TIARI, GANNON UNIVERSITY, USA

**Titles:** Generalizability of the Time-Lag Method for Mixed-Matrix Membranes: Does One Method Fit It All?

**FFHMT 146**

**Time:** 1:05 - 1:20

**Presenter:** Haoyu Wu, University of Ottawa, Canada

**Authors:** Haoyu Wu, Zheng Cao, Boguslaw Kruczek, Jules Thibault

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**Titles:** Estimation of the effective permeability of mixed-matrix membranes via Monte Carlo simulations

**FFHMT 148**

**Time:** 1:20 - 1:35

**Presenter:** Zheng Cao, University of Ottawa, Canada

**Authors:** Zheng Cao, Haoyu Wu, Boguslaw Kruczek and Jules Thibault

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# EHST'21 KEYNOTE LECTURE

MAY 23 | 1:55 PM - 2:40 PM | SESSION CHAIR: DR. JUNFENG ZHANG, LAURENTIAN UNIVERSITY, CANADA



**Titles:** High-Performance Thin Film Composite Membranes for Energy Harvesting using Pressure Retarded Osmosis (PRO)

[Dr. Mohtada Sadrzadeh, University of Alberta, Canada](#)

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Dr. Sadrzadeh researches the fundamental and applied aspects of membrane materials and process development, focusing on their applications in industrial/residential wastewater treatment and energy harvesting from wastewater. The contributions made by Dr. Sadrzadeh during his academic career thus far have led to the development and application of novel composite and nanocomposite membranes for water and gas treatment. He has an h-index of 32 (according to Scopus) with his 120+ refereed publications cited more than 2400 times. He is currently directing Advanced Water Research Lab (AWRL) at the University of Alberta that is equipped with membrane and nanoparticle synthesis and characterization equipment as well as membrane filtration systems. In this unique membrane-specialized facility in western Canada, ten graduate students and four postdoctoral fellows are working under his supervision on cutting-edge membrane technologies. He already graduated 7 PhD and 11 MSc students. Dr. Sadrzadeh is collaborating with nine oil and gas companies through Canada's Oil Sands Innovation Alliance (COSIA), IBM, National Research Council (NRC, Canada), Natural Resource Canada (NRCan, Canada) on the synthesis of high-performance membranes. His research work will be continued on the synthesis of advanced polymeric membrane materials and processes to produce clean water and clean energy from wastewater.



## SESSION

### ENERGY CONVERSION AND STORAGE II

MAY 23 | 2:40 PM - 3:40 PM | SESSION CHAIR: DR. MOHTADA SADRZADEH, UNIVERSITY OF ALBERTA, CANADA

**Titles:** Multiple Electrodes-based Bubble Motion Active Transducer for Effective Electrical Energy Harvesting

**EHST 116**

**Time:** 2:40 – 2:55

**Presenter:** Kapugedara Rohana Wijewardhana, University of Colombo, Sri Lanka

**Authors:** K. Rohana Wijewardhana, Thilini K. Ekanayaka, E. N. Jayaweera

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**Titles:** Implementation of Energy Harvester for Water Wave Power Producing Station

**EHST 101**

**Time:** 2:55 - 3:10

**Presenter:** George Nerubenko, Laser Weld Creation Inc., Canada

**Authors:** George Nerubenko, Moshe Michael Haimov

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**Titles:** Integration of Cement and Hydrogen Industries for Canada's Climate Plan: Case Study

**FFHMT 142**

**Time:** 3:10 - 3:25

**Presenter:** Kamiel Gabriel, Ontario Tech University, Canada

**Authors:** Rami S. El-Emam, Neha Bagria, Kamiel S. Gabriel

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**Titles:** Modelling of the Effects of Renewable Energy Establishments towards the Economic Growth of a Nation

**FFHMT 128**

**Time:** 3:25 - 3:40

**Presenter:** Chamil Abeykoon, The University of Mancheste, UK

**Authors:** Chamila H. Dasanayaka, Chamil Abeykoon, Padmi Nagirikandalage

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