FFHMT 2022

9th International Conference of Fluid Flow, Heat and Mass Transfer

EHST 2022

6th International Conference of Energy Harvesting, Storage, and Transfer

JUNE 08 - 10, 2022 | Niagara Falls, CANADA

Dr. Boguslaw Kruczek
University of Niagara Falls, Canada
CONFERENCE CHAIR

Dr. Wael H. Ahmed
University of Guelph, Canada
TECHNICAL PROGRAM CHAIR

Dr. Xianshe Feng
University of Waterloo, Canada
CONFERENCE CO-CHAIR

WENSDAY, JUNE 08

3:00 PM to 5:00 PM	Registrations & Networking

THURSDAY, JUNE 09

7:00 AM	Registration
8:00 AM	Official Opening
	KEYNOTE SESSION
8:15 AM	KEYNOTE LECTURE 1: Dr. Sebastien Poncet, University Of-Sherbrook, Canada PAGE 1- GBR NORTH
9:00 AM	KEYNOTE LECTURE 2: Dr. Mohammed Farid, The University of Auckland, New Zealand PAGE 2 - GBR NORTH
9:45 AM	Coffee Break
10:05 AM	PLENARY LECTURE 1: Dr. Andreas Mandelis, University of Toronto, Canada PAGE 2 - GBR NORTH
	MORNING PARALLEL SESSIONS
11:00 AM	Two and Multiphase Flow and Heat Transfer PAGE 3 - GBR NORTH
11:00 AM	CFD I PAGE (4-5) - GBR SOUTH
12:45 PM	Group Photo
12:50 PM	Lunch - PROMENADE SUIT
	KEYNOTE SESSION
01:40 PM	KEYNOTE LECTURE 3: Dr. Majid Bahrami, Simon Fraser University, Canada PAGE 6 - GBR NORTH
2:25 PM	PLENARY LECTURE 2: Dr. Nedjib Djilali , University of Victoria, Canada PAGE 6- GBR NORTH
3:20 PM	KEYNOTE LECTURE 4: Dr. Aicheng Chen, University of Guelph, Canada PAGE 7- GBR NORTH
4:05 PM	Coffee Break
	AFTERNOON PARALLEL SESSIONS
4:25 PM	Heat Transfer Augmentation and Porous Media PAGE 8 - GBR NORTH
4:25 PM	Heat Transfer Enhancement I PAGE 9 - GBR SOUTH

FRIDAY, JUNE 10

	KEYNOTE SESSION
8:00 AM	KEYNOTE LECTURE 5: Dr. Yogesh Jaluria, Rutgers University, USA PAGE 10 - GBR NORTH
8:45 AM	KEYNOTE LECTURE 6: Dr. Adrian Ilinca, Université du Québec à Rimouski, Canada PAGE 11 - GBR NORTH
	MORNING PARALLEL SESSIONS I
9:30 AM	Flow, Heat and Mass Transfer Devices PAGE (11-12) - GBR NORTH
9:30 AM	Biomass, Biofuel, and Bioenergy PAGE 12 - GBR NORTH
10:15 AM	Coffee Break
	MORNING PARALLEL SESSIONS II
10:35 AM	CFD II PAGE (13-14) - GBR NORTH
10:35 AM	Sustainable Energy I PAGE (14-15) - GBR SOUTH
12:25 PM	Lunch - NIAGRA WEST
1:15 PM	KEYNOTE LECTURE 7: Dr. S.A. Sherif, University of Florida, USA PAGE 16 - GBR NORTH
	AFTERNOON PARALLEL SESSIONS I
2:00 PM	Heat Transfer Enhancement II PAGE 17 - GBR NORTH
2:00 PM	Sustainable Energy II PAGE 18 - GBR SOUTH
3:15 PM	Coffee Break
	AFTERNOON PARALLEL SESSIONS II
3:35 PM	Mass Transfer with or without Reaction PAGE 19 - GBR NORTH
3:35 PM	Fluid Properties PAGE 20 - GBR SOUTH
	POSTER SESSION
10:15 AM	POSTER SESSION - PAGE 21
8:00 PM	Banquet Dinner - PAGE 21 - NIAGRA WEST

9th INTERNATIONAL CONFERENCE ON FLUID FLOW, HEAT AND MASS TRANSFER (FFHMT'22)

&

6th INTERNATIONAL CONFERENCE OF ENERGY HARVESTING, STORAGE, AND TRANSFER (EHST'22)

JUNE 08 - 10, 2022 | Niagara Falls, CANADA

The Organizing and Scientific Committees would like to welcome you to the 9th International Conference On Fluid Flow, Heat And Mass Transfer (FFHMT'22) & the 6th International Conference Of Energy Harvesting, Storage, And Transfer (EHST'22).

These International Conferences (FFHMT'22 and EHST'22) aim to become the leading international annual events in the fields related to fluid flow and heat transfer, and in the fields of energy harvesting, storage, and transfer. These Conferences will provide excellent opportunities for scientists, researchers, and industrial specialists to present their research achievements and to develop new collaborations and partnerships with experts in the field.

The conference is organized in Niagara Falls, Ontario, which is a Canadian city at the famous waterfalls of the same name, linked with the U.S. by the Rainbow Bridge, and we hope you will have time to enjoy the ambience and hospitality of this city.

We thank you for your participation and contribution to the 9th International Conference of Fluid Flow, Heat and Mass Transfer (FFHMT'22) and the 6th International Conference Of Energy Harvesting, Storage, And Transfer (EHST'22).

We wish you a very successful and enjoyable experience.

Dr. Boguslaw Kruczek
University of Ottawa, Canada
Conference Chair
FFHMT'22 & EHST'22

Dr. Wael H. Ahmed
University of Guelph, Canada
Technical Program Chair
FFHMT'22 & EHST'22

Dr. Xianshe Feng
University of Waterloo, Canada
Conference Co-Chair
FFHMT'22 & EHST'22

9th International Conference of Fluid Flow, Heat and Mass Transfer (FFHMT'22)

The Organizing Committee of the 9th International Conference of Fluid Flow, Heat and Mass Transfer (FFHMT'22) would like to thank the following members for accepting to contribute to the conference.

Scientific Committee Members:

Dr. Rayhaneh Akhavan, *University of Michigan-Ann Arbor, USA*

Dr. Sanjeev Chandra, *University of Toronto, Canada*

Dr. Yan Chen, *Purdue University, USA*

Dr. Yusuf Chisti, *Massey University, New Zealand*

Dr. Jiangtao Cheng, *Virginia Tech, USA*

Dr. Lixin Cheng, *Sheffield Hallam University, UK*

Dr. Sadegh Dabiri, *Purdue University, USA*

Dr. Kamiel Gabriel, *University of Ontario Institute of Technology, Canada*

Dr. Mohamed Hamed, *McMaster University, Canada*

Dr. Huan-Jang Keh, *National Taiwan University, Taiwan*

Dr. Sunwoo Kim, *University of Alaska Fairbanks, USA*

Dr. Nikolai Kozlov, *Institute of Continuous Media Mechanics UrB RAS, Russia*

Dr. Robert J. Martinuzzi, *University of Calgary, Canada*

Dr. Lee Poh Seng, *National University of Singapore, Singapore*

Dr. Lian Shen, *University of Minnesota, USA*

Dr. Jules Thibault, *University of Ottawa, Canada*

Dr. Junfeng Zhang, *Laurentian University, USA*

6th International Conference of Energy Harvesting, Storage, and Transfer (EHST'22)

The Organizing Committee of the 6th International Conference of Energy Harvesting, Storage, and Transfer (EHST'22) would like to thank the following members for accepting to contribute to the conference.

Scientific Committee Members:

Dr. Dorota Chwieduk, *Warsaw University of Technology, Poland*

Dr. Eduard Doujak, *Vienna University of Technology, Austria*

Dr. Akhtar Hussain, *University of Alberta, Canada*

Dr. Prasad Kaparaju, *Griffith University, Australia*

Dr. Sylvie Lorente, *INSA Toulouse, France*

Dr. Eugen RUSU, *University of Lisbon, Portugal*

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

Dr. Sascha Stegen, *Griffith University, Australia*

Dr. Ali Tarokh, *Lakehead University, Canada*

Dr. Igor Zhitomirsky, *McMaster University, Canada*

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Thursday, June 09, 2022

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Friday, June 10, 2022

7:00 AM - 8:00 AM
GBR North

Registration

9:00 AM - 9:15 AM
GBR North

Official Opening

Dr. Boguslaw Kruczek, *University of Ottawa, Canada*

GBR North
08:15 AM - 09:00 AM

Keynote Lecture

SESSION CHAIR: Dr. Boguslaw Kruczek, University of Ottawa, Canada

Advanced CFD Modeling Of Slurry Flows: A Practical Review

Dr. Sebastien Poncet,
University Of Sherbrook, Canada

Sébastien Poncet received his engineering diploma and his master degree in physical oceanography from Seatech (Toulon, France) in 2002 and the Ph.D. degree in complex systems from Aix-Marseille University (Marseille, France) in 2005, for a thesis on turbulent rotor-stator interdisk flows (two national awards). He was then assistant lecturer for one year before getting a position of assistant professor at Aix-Marseille University in 2006. He joined the University of Sherbrooke as an Associate Professor of Mechanical Engineering in 2014, where he currently is the chairholder of the NSERC/Hydro-Québec/Natural Resources Canada/Emerson Industrial Research Chair in Industrial Energy Efficiency. He is now full professor in the mechanical engineering department and the director of LMFTEUS lab (https://lmfteus.wordpress.com). His research interests include the experimental characterization of the thermophysical properties of complex heat transfer fluids (nanofluids, slurries, PCMs) and the advanced numerical modelings of thermal systems (supersonic ejector, vortex tube, magnetocaloric refrigeration, heat exchanger, turbomachineries…). He is the coauthor of about 250 research papers whose about 100 in international journals.

GBR North
09:00 AM - 09:45 AM

Keynote Lecture

SESSION CHAIR: Dr. Boguslaw Kruczek, University of Ottawa, Canada

Forty Years of Innovations in Energy storage With Phase Change

Dr. Mohammed Farid,
The University of Auckland, New Zealand

Professor Mohammed Farid has completed his BE at University of Baghdad, ME and PhD at University of Swansea, Wales. He is Fellow of the Institution of Chemical Engineers and has published more than 400 papers in international journals and refereed conferences, 6 patents, 5 books, and 13 chapters in books. He has received several international awards and was invited as a keynote speaker to many international conferences. He is a world leader in energy storage for better environment and has provided significant contribution to the field worldwide.

09:45 AM - 10:05 AM **COFFEE BREAK**

GBR North
10:05 AM - 11:00 AM

Plenary Lecture

SESSION CHAIR: Dr. Boguslaw Kruczek, University of Ottawa, Canada

Carrier Diffusion Waves in Electronic Solids used in Clean Energy Technologies

Dr. Andreas Mandelis,
University of Toronto, Canada

Andreas Mandelis, FRSC, FCAE, FAPS, FSPIE, FAAAS, FASME, DF-IETI, PhD, is a Full Professor of Mechanical and Industrial Engineering; Electrical and Computer Engineering; and the Institute of Biomaterials and Biomedical Engineering, University of Toronto. He is the Canada Research Chair (Tier 1) in Diffusion-Wave and Photoacoustic Sciences and Technologies. He is the Director of the Institute for Advanced Non-Destructive and Non-Invasive Diagnostic Technologies (IANDIT) and of the Center for Advanced Diffusion-Wave and Photoacoustic Technologies (CADIPT) at the University of Toronto. He is also the President and CTO of Diffusion-Wave Diagnostic Technologies, Inc., Toronto, ON (www.diffusewavetech.com). He received his BS degree (Magna cum Laude) in physics from Yale University, and MA, MSE, and Ph.D. degrees from the Applied Physics and Materials Laboratory, Princeton University. He is the author and co-author of 440+ scientific papers in refereed journals and 190+ scientific and technical proceedings papers.

MORNING PARALLEL SESSION (FFHMT) - GBR NORTH

11:00 AM - 12:45 PM
GBR North

Two and Multiphase Flow and Heat Transfer

SESSION CHAIR: Dr. Boguslaw Kruczek, University of Ottawa, Canada & Dr. Kyung Chun Kim, Pusan National University, South Korea

FFHMT 212
11:00 - 11:15

Towards Understanding the Interfacial Structures of Non-Developing Slug Flow in Vertical Pipes

Shahriyar Ghazanfari Holagh, University of Guelph, Canada
Authors: Shahriyar G. Holagh, Wael H. Ahmed

FFHMT 197
11:15 - 11:30

A Multiphase Flow Approach for Ethanol Blended Fuels

Mustafa Emre Bayraktar, Bosch San. ve Tic. A.Ş., Turkey
Authors: M. Emre Bayraktar, Can Ünsal, Reza Eslami, A. Alper Özalp

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FFHMT 128
11:30 - 11:45

Characterization of Wick Evaporators through the Behavior of the Specially Designed Condenser

Ella Barakhovskaia, Université libre de Bruxelles, Belgium & Novosibirsk State University, Kutateladze Institute of Thermophysics SB RAS, Russia
Authors: Ella Barakhovskaia, Andrey Glushchuk, Igor Marchuk, Patrick Queeckers, Carlo Saverio Iorio

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FFHMT 195
11:45 - 12:00

Experiment and CFD Simulation of HFE-7100 Boiling from Onset to Dry-out in a Vertical Mini-channel

Lioger--Arago Robin, Univ Grenoble Alpes, France
Authors: Lioger--Arago Robin, Coste Pierre, Caney Nadia

FFHMT 185
12:00 - 12:15

Comparison of Experimental Heat Transfer Coefficient with Qualitative Description of Classical Heat Transfer Coefficient at Low Heat Flux Conditions

Ernest Gyan Bediako, Technical University of Liberec, Czech Republic
Authors: Ernest Gyan Bediako, Petra Dancova, Tomas Vit

FFHMT 211

12:15 - 12:30

CFD Modelling Of Film Deposition from a Receding Meniscus in a Capillary Tube Using the Approach of Overset Grid Technique

Alihossein Nikkhah, Univ. de Sherbrooke, Canada

Authors: Alihossein Nikkhah, Nooshin Karami, Albert Tessier-Poirier, Omid Abouali, Luc G. Fréchette

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FFHMT 101

12:30 - 12:45

Chronic Leak Detection in an Oil and Gas Transportation

Mohammad Azizur Rahman, Texas A&M University, Qatar

Authors: Abdallah Zamli, Reem Almajdoubeh, Saly Awadh, Harris Rabbani, Mohammad Azizur Rahman

MORNING PARALLEL SESSION (FFHMT) - GBR SOUTH

11:00 AM - 12:45 AM

CFD I

SESSION CHAIR: Dr. Saeed Tiari, Gannon University, USA & Dr. Marek Borowiec, Lublin University of Technology, Poland

FFHMT 170

11:00 - 11:15

Post-Blackout Response of Backup Power Supply on the Safety of Nuclear Fuel Storage Vault

Vivek Kumar Mishra, Indira Gandhi Centre for Atomic Research, India

Authors: Vivek K. Mishra, Saroj K. Panda, Biswanath Sen, M. P. Maiya, B. P. C. Rao

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FFHMT 145

11:15 - 11:30

Sensitivity to Snapshot Frequency in the POD-based Reduced-Order Modelling of Flow over a Gaussian Bump

Donya Ramezanian, University of Southern California, USA

Authors: Donya Ramezanian, Michael W. Lee, Naili Xu, and Iván Bermejo-Moreno

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FFHMT 153

11:30 - 11:45

Heat Transfer Inside an Electric Motor

Ahmed Teamah, McMaster University, Canada

Authors: Ahmed M. Teamah, Mohamed S. Hamed

FFHMT 157

11:45 - 12:00

Experimental Analysis and CFD Modelling of the Flow Conditions inside an Air-Core-Liquid-Ring Atomizer

Miguel Ballesteros, Karlsruhe Institute of Technology, Germany
Authors: Miguel Ballesteros, Volker Gaukel

FFHMT 188

12:00 - 12:15

Modelling the Bubbling Bed State for Alumina Powders under Reduced Operating Pressure

Lanka H Dinushke S Weerasiri, Deakin University, Australia
Authors: Lanka Dinushke Weerasiri, Subrat Das, Daniel Fabijanic

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FFHMT 147

12:15 - 12:30

Modelling Of Pulverized Coal Combustion with the Char Structure Effect in Melter-Gasifier

Yoon-ho Bae, Pusan National University, Republic of Korea
Authors: Yoon-ho Bae, Kang-min Kim, Byoung-hwa Lee, Chung-hwan Jeon

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FFHMT 139

12:30 - 12:45

Numerical Investigation on Evolving Chip Geometry and Its Impact on Convective Heat Transfer during Orthogonal Cutting Processes

Thorsten Helmig, RWTH Aachen University, Germany
Authors: Thorsten Helmig, Tim Göttlich, Hui Liu, Nhat Nguyen, Thomas Bergs and Reinhold Kneer

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12:45 PM - 12:50 PM **GROUP PHOTO**

12:50 PM - 01:40 PM **LUNCH BREAK**

GBR North
01:40 PM - 02:25 PM

Keynote Lecture

SESSION CHAIR: Dr. Wael H. Ahmed, University of Guelph, Canada

Decarbonizing the Heat: Challenges and Opportunities

Dr. Majid Bahrami,
Simon Fraser University, Canada

Dr. Bahrami, P.Eng. is a Professor of Mechanical Engineering, the Program Director of NSERC CREATE Hybrid Thermal Electric Microgrids (HyTEM), and a Tier 1 Canada Research Chair in Alternative Energy Conversion Systems at SFU. He is a Fellow of the Canadian Academy of Engineers (FCAE) and the American Society of Mechanical Engineers (FASME). Bahrami championed interdisciplinary, collaborative research in multitudes of sustainable clean energy systems, including: harvesting and transforming low-grade heat for sustainable air conditioning, thermal energy storage, atmospheric water harvesting, heat pump systems and dehumidification for applications in automotive, agri-food, sustainable city, and thermal hybrid microgrids. He has a strong track record in successful collaboration with national and international research institutes and industry. He formed 2 start-ups; won national and international research and innovation awards; published 8 patents and 300+ publications; and supervised 160+ highly qualified personnel, including 7 professors.

GBR North
02:25 PM - 03:20 PM

Plenary Lecture

SESSION CHAIR: Dr. Wael H. Ahmed, University of Guelph, Canada

Flow, Heat and Mass Transfer in Fuel Cells and Hydrogen Systems

Dr. Nedjib Djilali,
University of Victoria, Canada

Ned Djilali is a Professor of Mechanical Engineering and Director of the Institute for Integrated Energy Systems at the University of Victoria. His research focuses on transport phenomena and energy systems analysis. The applications of this research have ranged from aerodynamics and zero-emission vehicles to electrochemical energy conversion and the water-energy nexus. Prior to joining UVic, he was staff specialist with the Advanced Aerodynamics Department at Bombardier Inc., where he worked on the design of the Regional Jet. At UVic he has established an internationally recognized research laboratory in the areas of thermofluid science, energy systems and fuel cell science and technology, and trained many graduates who have become leaders in academia and industry.

GBR North
03:20 PM - 04:05 PM

Keynote Lecture

SESSION CHAIR: Dr. Wael H. Ahmed, University of Guelph, Canada

Design of Nanostructured Catalysts and Nanocomposites for Hydrogen Production and Storage

Dr. Aicheng Chen,
University of Guelph, Canada

Aicheng Chen is Professor of Chemistry, Tier 1 Canada Research Chair in Electrochemistry and Nanoscience, and Director of the Electrochemical Technology Centre at the University of Guelph. He received his MSc from Xiamen University under the supervision of Prof. S.-G. Sun and his PhD from the University of Guelph in 1998 under the direction of Prof. J. Lipkowski. His research interests span the areas of Electrochemistry, Photoelectrochemistry, Green Chemistry, and Nanoscience. Prof. Chen has received numerous awards, including the Ontario Premier's Research Excellence Award, the Japan Society for the Promotion of Science (JSPS) Invitation Fellowship, the Lash Miller Award and the R.C. Jacobsen Award of the Electrochemical Society Canada Section, the Fred Beamish Award, the Keith Laidler Award and the W.A.E. McBryde Medal of the Canadian Society for Chemistry, the Canadian Catalysis Lectureship Award, and the RBC Innovation Award. He has also been named as Fellow of the Chemical Institute of Canada, Fellow of the Royal Society of Chemistry (UK), Fellow of the International Association of Advanced Materials, and Fellow of the International Society of Electrochemistry.

4:05 PM - 04:25 PM **COFFEE BREAK**

AFTERNOON PARALLEL SESSION (FFHMT) - GBR NORTH

04:25 PM - 05:55 PM
GBR North

Heat Transfer Augmentation and Porous Media

SESSION CHAIR: Dr. Wael H. Ahmed, University of Guelph, Canada & Dr. Esam Ismaeel Jassim, Prince Mohammad Bin Fahd University, KSA

FFHMT 196
04:25 - 04:40

Experimental Study of the Collapse of Granular Columns

Li-Tsung Sheng, National Central University, Taiwan
Authors: Li-Tsung Sheng, Shu-San Hsiau

FFHMT 192
04:40 - 04:55

Polymeric Hollow Fiber Heat Exchangers in Higher Temperatures

Tereza Kroulíková, BUT, Czech republic
Authors: Tereza Kroulíková, Erik Bartuli, Tereza Kůdelová

FFHMT 144
04:55 - 05:10

Experimental Analysis of a Latent Heat Thermal Energy Storage System Enhanced by Variable-Length Radial Fins

Saeed Tiari, Gannon University, USA
Authors: Kyle Shank, Samantha Moretti, Jessica Bernat, Saeed Tiari

FFHMT 125
05:10 - 05:25

Influence of Porous Oxide Layer on Water Spray Cooling

Ondřej Resl, Brno University of Technology, Czech Republic
Authors: Ondřej Resl, Martin Chabičovský, Milan Hnízdil, Petr Kotrbáček, Miroslav Raudenský

FFHMT 171
05:25 - 05:40

Heat Transfer Characteristics of A Porous Medium Subjected To Water Jet Impingement

William Arthur Bevan, Youngstown State University, USA
Authors: William Bevan and Kyosung Choo

FFHMT 123
05:40 - 05:55

Turbulent Adsorption of VOC in Zeolite Doped Metal Foam

Kyung Chun Kim, Pusan National University, South Korea
Authors: Minsin Kim, Youngwoo Kim, Kyung Chun Kim

AFTERNOON PARALLEL SESSION (FFHMT) GBR SOUTH

Heat Transfer Enhancement I

04:25 PM - 5:40 PM

GBR South

SESSION CHAIR: Dr. Boguslaw Kruczek, University of Ottawa, Canada & Dr. Marek Borowiec, Lublin University of technology, Poland

FFHMT 204

04:25 - 04:40

Magnetohydrodynamic Natural Convection of In-Ga-Sn Alloy in a Horizontal Concentric Annulus with Internal Fins

Aidan Hickie-Bentzen, University of Guelph, , Canada
Authors: Aidan Hickie-Bentzen, Syeda Humaira Tasnim, Shohel Mahmud

FFHMT 201

04:40 - 04:55

Reduction of the Recirculation Region of a Backward-Facing Step Flow

James Kofi Arthur, Bucknell University, USA
Author: James Kofi Arthur

FFHMT 160

04:55 - 05:10

Intensification of Heat Transfer by the Method of Artificial Roughness at a Water Film Flows down on Vertical Pipe

Giorgi Gigineishvili, Georgian Technical University, Georgia
Authors: Tengiz Magrakvelidze, Giorgi Gigineishvili, Avksenti Mikashavidze, Tariel Koberidze, Khatuna Lomidze

FFHMT 140

05:10 - 05:25

Experimental Investigation of Contact Heat Transfer at High Pressures

Tim Göttlich, RWTH Aachen University, Germany
Authors: Tim Göttlich, Thorsten Helmig, Nicklas Gerhard, Thomas Bergs and Reinhold Kneer

FFHMT 155

05:25 - 05:40

Transient Thermal and Electrical Characteristics of a Cylindrical LiFeS2 Cell with Equivalent Circuit Model

Khaled Alsharif, Youngstown State University, USA
Authors: Khaled I Alsharif, Alexander H Pesch, Vamsi Borra, Pedro Cortes, Eric MacDonald, Frank X Li, Kyosung Choo

GBR North
08:00 AM - 08:45 AM

Keynote Lecture

SESSION CHAIR: Dr. Wael H. Ahmed, University of Guelph, Canada

Transport Phenomena in Advanced Materials Processing

Dr. Yogesh Jaluria,
Rutgers University, USA

Dr. Yogesh Jaluria is Board of Governors Professor and Distinguished Professor at Rutgers, the State University of New Jersey. His research work is in the field of thermal science and engineering, covering areas like convection, fires, materials processing, thermal management of electronics, energy, and environment. He is the author/co-author of 10 books and editor/coeditor of 15 conference proceedings, 13 books, and 13 special issues of archival journals. He has contributed over 500 technical articles, including over 225 in archival journals and 22 book chapters. He has received several awards and honors for his work, such as the prestigious 2020 Holley Medal from ASME for his work on optical fiber drawing, the 2007 Kern Award from AIChE, the 2003 Robert Henry Thurston Lecture Award from ASME, and the 2002 Max Jakob Memorial Award, the highest international recognition in heat transfer, from ASME and the AIChE. He has served as Department Chairman and as Dean of Engineering. He was the Editor of the Journal of Heat Transfer and Computational Mechanics. He is an Honorary Member of ASME, a Fellow of AAAS, ASTFE and APS, and an Associate Fellow of AIAA. He served as the founding President of the American Society of Thermal and Fluids Engineers (ASTFE) from 2014 to 2019.

GBR North
08:45 PM - 09:30 PM

Keynote Lecture

SESSION CHAIR: Dr. Wael H. Ahmed, University of Guelph, Canada

Optimization of Renewable Energy Penetration in Hybrid Systems through Pneumatic Hybridization of Diesel Generators

Dr. Adrian Ilinca,
Université du Québec à Rimouski, Canada

Adrian ILINCA is Professor at Université du Québec à Rimouski since 1994 after receiving his Ph.D. from École Polytechnique de Montréal. The main areas of interest are renewable energies, hybrid energy systems, energy storage, and, more recently, optimization in these areas using artificial intelligence. The main contributions are the adaptation of wind energy technologies to cold climates, optimization of hybrid systems allowing higher renewable energy penetration, different energy storage systems. The resulting technologies are applied for remote areas' electricity production and in rail and maritime transport industries to reduce GHG emissions.

MORNING PARALLEL SESSION (FFHMT) - GBR NORTH

09:30 AM - 10:15 AM
GBR North

Flow, Heat and Mass Transfer Devices

SESSION CHAIR: Dr. Kyung Chun Kim, , Pusan National University, South Korea

FFHMT 190
09:30 - 09:45

Hydrothermal Performance of Liquid-Cooled Battery Thermal Management System with Multiple Inlets

Kuuku-Dadzie Botchway, University of the District of Columbia, USA
Authors: NKuuku-Dadzie Botchway, Mohammad Reza Shaeri

FFHMT 202
09:45 - 10:00

Artificial Neural Network to Predict Pressure Drops in Heat Sinks

Betelhiem Mengesha, University of the District of Columbia, USA
Authors: Betelhiem N. Mengesha, Mohammad Reza Shaeri, Soroush Sarabi

FFHMT 181

10:00 - 10:15

Viscosity Effects on the Global Hydrodynamics and Mass Transfer of Internal Loop Ailift

Mohameden JEIED, LMFA-INSA Lyon, France
Author: Mohameden JEIED

MORNING PARALLEL SESSION (EHST) - GBR SOUTH

Biomass, Biofuel, and Bioenergy

9:30 AM - 10:15 AM
GBR South

SESSION CHAIR: Dr. Suresh Chandra Srivastava, Indian Institute of Technology Kanpur, India & Dr. Ghalib Kahwaji, Rochester Institute of Technology- Dubai, UAE

EHST 129

09:30 - 09:45

Utilization of Agro-Residue Wastes Through Clean Combustion for Sustainable Energy Solutions in Jaggery Production

Himanshu, Indian Institute of Technology Delhi, India
Authors: Himanshu, Alok Kumar, Aditya Gupta, S. K. Tyagi

EHST 135

09:45 - 10:00

Study of Eco-Efficiency Based On Quantitative Ecological Trade-Offs

Usman Akbar, Yanshan University, China
Authors: Usman Akbar, Rocky J. Dwyer

FFHMT 131

10:00 - 10:15

Investigation of the Waste Heat Recovery System of a Biomass Combustion Plant through Ground Source Heat Pumps

Babak Dehghan, Politecnico di Milano, Italy
Authors: Babak Dehghan B., Linwei Wang, Mario Motta, Nader Karimi

10:15 AM - 10:35 AM **COFFEE BREAK**

MORNING PARALLEL SESSION II (FFHMT) - GBR NORTH

10:35 AM - 12:30 PM
GBR NORTH

CFD II

SESSION CHAIR: Dr. Boguslaw Kruczek, University of Ottawa, Canada & Dr. James Kofi Arthur, Bucknell University, USA

FFHMT 189
10:35 - 10:50

Numerical Investigation on the Geyser Boiling in High Temperature Wick Sodium Heat Pipe based on CFD method

Wang Dahai, Shanghai Jiao Tong University, China
Authors: Wang Dahai, Hong Fangjun

FFHMT 191
10:50 - 10:55

Numerical Investigation on the Flows Within Friction Pairs of a Wet Clutch

Qian Wang, Beijing Institute of Technology, China
Authors: Qian Wang, Biao Ma, Changsong Zheng, Liang Yu, Liyong Wang, Liangjie Zhen

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FFHMT 154
10:55 - 11:10

Performance Analysis of an Ejector-Diffuser for Vapor Jet Refrigeration

Sankrish Jayachandran, Indian Institute of Technology Madras, India-
Authors: Sankrish Jayachandran, T. Sundararajan

FFHMT 134
11:10 - 11:25

Regeneration of an Aqueous Potassium Lysinate to Capture CO2 in a Membrane Unit

Nayef Ghasem, UAE University, UAE
Author: Nayef Ghasem

FFHMT 138
11:25 - 11:40

Computational Study of Taylor Bubbles Drift Velocity in Inclined Multiphase Flow

Ibrahim Ahmed, Leeds University, UK
Author: Ibrahim Ahmed

FFHMT 175
11:40 - 11:45

Bayesian Belief Network Analysis of a Large Eddy Simulated Ocean Turbulence Field

Nicholas V. Scott, Open Innovation Center, Dayton Research Center, USA
Authors: Nicholas V. Scott and Tobias Kulkulka

FFHMT 164

11:45 - 12:00

Modeling of Additive Manufacturing-like Rough Walls from Roughness-resolved LES Database

Alexis Barge, Univ. Grenoble Alpes, France
Authors: Alexis Barge, Serge Meynet, Vincent Moureau, Guillaume Balarac, Abdellah Hadjadj, Ghislain Lartigue

EHST 133

12:00 - 12:15

The Design of a Savonius Wind Turbine with Guide Vanes - A Computational Approach

Chamil Abeykoon, The University of Manchester, UK
Authors: Wimukthi Senarathna, Madhawa Fernando, Tharindu Silva, Chamil Abeykoon

FFHMT 208 & 209

12:15 - 12:30

Effect of Stack Position and Stack Length on the Performance of Thermoacoustic Engine

Ussama Ali, Khalifa University of Science and Technology, UAE
Authors: Yara Al Masalmeh, Ussama Ali, Md Islam, Isam Janajreh

MORNING PARALLEL SESSION II (FFHMT & EHST) - GBR SOUTH

10:35 AM - 12:25 PM
GBR South

Sustainable Energy I

SESSION CHAIR: Dr. Suresh Chandra Srivastava, Indian Institute of Technology Kanpur, India & Dr. Ghalib Kahwaji, Rochester Institute of Technology- Dubai, UAE

EHST 134

10:35 - 10:50

Photo-Excited Charge Transfer Between A-Si:H/C-Si

Haili Li, Kyoto University, Japan
Authors: Haili Li, Mitsuhiro Matsumoto

FFHMT 214

10:50 - 10:55

The Influence of Tio2 Nanoparticles and Libr on the Exergy Efficiency of Ammonia Absorption Refrigeration System under Different Working Temperatures

Jin Zhenghao, Southeast University, China
Authors: Jin Zhenghao, Shuhong Li, Kai Du

FFHMT 187

10:55 - 11:10

Characterizing Non-Newtonian Two-Phase Flow in Airlift Pumps

Josh Rosettani, University of Guelph , Canada
Authors: Josh Rosettani, Dana Fadlalla, Wael Ahmed

EHST 122
11:10 - 11:25

Effect of Oil Consumption over an Innovative Exhaust After-Treatment System Suitable For Cogeneration Plants

Pietro Capaldi, STEMS Institute, Italy
Authors: Francesca Maria Grimaldi, Pietro Capaldi

FFHMT 173
11:25 - 11:40

Dynamical Properties of Polymer Composites Subjected to Effecting of Environmental Conditioning

Marek Borowiec, Lublin University of Technology, Poland
Authors: Marek Borowiec, Ewelina Kosicka

EHST 145
11:40 - 11:55

Effect of Oil Consumption over an Innovative Exhaust After-Treatment System Suitable For Cogeneration Plants

Ahd Faisal Abdelaziz Farah, University of Khartoum Department of Mechanical Engineering, Sudan
Authors: Esra Khalfalla, Ahd Farah, Omer E Mohamed

FFHMT 215
11:55 - 12:10

A Numerical Investigation of the Feasibility of a Concentrating Photovoltaic Thermal System based on Point-Focus Fresnel Lens

Rida Hmouda, Memorial University of Newfoundland, Canada
Authors: Rida Hmouda, Memorial University of Newfoundland, Canada

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EHST 141
12:10 - 12:25

Heat Transfer Analysis of Heat Pump Ground-Sourcing Using Large Boreholes and Concentric Flow

Kent Udell, University of Utah, USA
Authors: Kent Udell, Kevin Maher

12:25 PM - 01:15 PM

LUNCH BREAK - NIAGRA WEST

GBR North
01:15 PM - 02:00 PM

Keynote Lecture

SESSION CHAIR: Dr. Boguslaw Kruczek, University of Ottawa, Canada

Mass-Based Optimization of Thermal Management and Power Systems for Space-Based Applications

Dr. S.A. Sherif,
University of Florida, USA

Dr. S.A. Sherif is a tenured Professor of Mechanical and Aerospace Engineering and is the Founding Director of the Wayne K. and Lyla L. Masur HVAC Laboratory, the Director of the Industrial Assessment Center and the Director of the Mobile Energy Laboratory at the University of Florida. He served as Co-Director of the Southeastern Center for Industrial Energy Intensity Reduction at the University of Florida (2009-2013). He also served on the faculties of the University of Florida (1991-present), University of Miami (1987-1991), and Northern Illinois University (1984-1987). He is a Life Fellow of ASME, a Life Fellow of ASHRAE, a Fellow of the Royal Aeronautical Society, and an Associate Fellow of AIAA. He served as Technical Editor of the ASME Journal of Thermal Science and Engineering Applications (2014-2019), Technical Editor of the ASME Journal of Solar Energy Engineering (2020-2025), and as Subject Editor of the International Journal of Hydrogen Energy (2005-2011). He has also served as Subject Editor, Associate Editor, or Editorial Board Member of 22 other journals. He has one book, more than 500 publications, and two US patents.

AFTERNOON PARALLEL SESSION I (FFHMT) - GBR NORTH

02:00 PM - 03:15 PM

GBR North

Heat Transfer Enhancement II

SESSION CHAIR: Dr. James Kofi Arthur, Bucknell University, USA & Dr. Jules Thibault, University of Ottawa, Canada

FFHMT 206
02:00 - 02:15

Ansys Fluent Automation for Fluid Flow and Heat Transfer in Corrugated Channels

Mohamed Shaimi, Hassan II University of Casablanca, Morocco
Authors: Mohamed Shaimi, Rabha Khatyr, Jaafar Khalid Naciri

FFHMT 172
2:15 - 2:30

Improvement of Plate-Type Heat Exchanger Performance by Employing Metallic Oxide Nanofluid

Esam Jassim, Prince Mohammad Bin Fahd University, KSA
Authors: Esam Jassim, Faizan Ahmed, Bashar Jassim

FFHMT 213
2:30 - 2:45

Enhancement Of The Parallel And Series Mode Of The Ultrasonic Atomizer On The Ammonia-Water Falling Film Absorber

Runfa Zhou, Southeast University, China
Authors: Runfa Zhou, Minqi Wang, Shuhong Li

FFHMT 118
2:45 - 3:00

Parametric Modelling of Layer-Configuration and Heat sink-controlled Surface Temperatures of Layered Materials

Edward Conrad Michaelchuck Jr., 1U.S. Naval Research Laboratory, USA
Authors: Edward Michaelchuck Jr., Scott Ramsey, Troy Mayo, Samuel Lambrakos

FFHMT 207
3:00 - 3:15

Numerical Analysis of Horizontally Placed Closed Loop Pulsating Heat Pipe for Electronic Cooling

Roshan Bhagat, Institute of Technology and Research, India
Authors: Roshan Devidas Bhagat, Samir Deshmukh

AFTERNOON PARALLEL SESSION I (EHST) - GBR SOUTH

02:00 PM - 03:20 PM
GBR South

Sustainable Energy II

SESSION CHAIR: Dr. Yogesh Jaluria, Rutgers University, USA

EHST 116 & 117
02:00 - 02:20

EHST 116 - Optimization of High-Capacity Ground-Coupled Heat Exchanger under Hot-Wet Climate Condition: Numerical Approach

EHST 117 - Maximizing Performance of Ground-Coupled Heat Exchanger under Hot-Wet Climate Condition: Experimental and Numerical Analysis

Ghalib Kahwaji, RIT Dubai University, UAE
Authors: EHST-116 Ghalib Kahwaji, Davide Capuano, Giada Boudekji, Mohamed Samaha
Authors: EHST-117 Ghalib Kahwaji, Muhannad Ali, Giada Boudekji, Davide Capuano, Abdelrahman Naserldin, Abdullah Khan, Mohamed Samaha

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EHST 137
2:20 - 2:35

Solidification Process inside a Novel Toroidal Tube Heat Exchanger

Mohammad Reza Mohaghegh, University of Guelph, Canada
Authors: Mohammad Reza Mohaghegh, Mehran Bozorgi, Kasra Ghasemi, Syeda Tasnim, Shohel Mahmud

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EHST 125
2:35 - 2:50

Setting Up a Thermal Energy Storage System for Peak Load Management through Airconditioning Load Shift

Suresh Chandra Srivastava, Indian Institute of Technology Kanpur, India
Authors: Suresh Chandra Srivastava, Sameer Khandekar, Shiv Kumar Singh, Vinay Kumar Tiwari, Ankush Sharma

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EHST 146
2:50 - 3:05

The Effectiveness Of ICEV Phase Out At 2035 In Terms Of CO2 Emission Reduction In The Italian Scenario

Francesca Maria Grimaldi, STEMS-CNR, Italy
Authors: Francesca Maria Grimaldi, Pietro Capaldi

EHST 142
3:05 - 3:20

Theoretical and Computational Models of the Performance of a Cylindrical Thermo-Chemical Battery During Charging and Operational Modes

Ali Hedayat, University of Utah, USA
Authors: Ali Hedayat, Kent S. Udell

3:15 PM - 3:35 PM **COFFEE BREAK**

AFTERNOON PARALLEL SESSION II (FFHMT & EHST) - GBR NORTH

03:35 PM - 05:10 PM
GBR North

Mass Transfer with or without Reaction

SESSION CHAIR: Dr. Esam Ismaeel Jassim, Prince Mohammad Bin Fahd University, KSA & Dr. Ghalib Kahwaji, Rochester Institute of Technology- Dubai, UAE

FFHMT 198
03:35 - 03:50

Numerical Approach in Determination of Thermophysical Material Properties in Decomposition of Lumpy Dolomite Particles

Aliyu Waliyu Abdulkadir, University of Magdeburg, Germany
Authors: Waliyu Abdulkadir Aliyu, Md. Ishtiaque Hossain, Eckehard Specht

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FFHMT 148
03:50 - 04:05

Mass Transfer Induced Rayleigh-Taylor Instabilities between Two Immiscible Liquids: The Unique Case of Corium

Romain Le Tellier, CEA, DES, IRESNE, DTN, Cadarache, France
Author: Romain Le Tellier

FFHMT 132
04:05 - 04:10

Machine Learning Based Statistical Characterization of a Turbulence Dissipation Rate Array: A Revisitation

Nicholas V. Scott, Open Innovation Center, Dayton Research Center, USA
Authors: Nicholas V. Scott and Jack McCarthy

FFHMT 176
04:10 - 04:25

Topology Optimization of Heat and Mass Transfer Systems using Level-Sets and Anisotropic Mesh Adaptation

Wassim Abdel Nour, CEMEF - Mines Paris - PSL Research University, France
Authors: Wassim Abdel Nour, Joseph Jabbour, Damien Serret, Philippe Meliga, Elie Hachem

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EHST 127
04:25 - 4:40

Metals Reclaim from Waste Liquid Crystal Display by Microbiological Means

H. Hocheng, National Tsing Hua University, Taiwan
Authors: H. Hocheng, C. Su, M. Chakankar

FFHMT 127
4:40 - 4:55

Natural convection in Phase Change Material: experimental study

Justine NOEL, LEMTA Université de Lorraine, Nancy, France
Authors: Justine NOEL, Christel METIVIER, Nicolo SGREVA, Sébastien LECLERC

FFHMT 270
4:55 - 5:10

Estimation of Mixed-Matrix Membrane Relative Permeability Using Monte Carlo Simulation

Jules Thibault, University of Ottawa, Canada
Authors: Zheng Cao, Haoyu Wu, Boguslaw Kruczek and Jules Thibault

AFTERNOON PARALLEL SESSION II (FFHMT) - GBR NORTH

03:35 PM - 04:35 PM
GBR North

Fluid Properties

SESSION CHAIR: Dr. Yogesh Jaluria, Rutgers University, USA

FFHMT 122
03:35 - 03:50

Heat Transfer Coefficients in Perforated Fins

Kymani Brown, University of the District of Columbia, USA
Authors: Kymani M. Brown, Mohammad Reza Shaeri

FFHMT 135
03:50 - 04:05

Thermal Efficiency Improvement of Brayton Cycle in the Presence of Phase Change Material

Saeed Tiari, Gannon University, USA
Authors: Alireza Khademi, Seyed Ali Abtahi Mehrjardi, Saeed Tiari, Karim Mazaheri, Mohammad Behshad Shafii

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FFHMT 121
04:05 - 04:20

Effects of Inlet Flow Rates on Purge Durations in an Atomic Layer Deposition Process

Betelhiem Mengesha, University of the District of Columbia, USA
Authors: Betelhiem N. Mengesha, Mohammad Reza Shaeri

FFHMT 117
04:20 - 04:35

Calculation of the Pressure Field around a Spherical-Cap Bubble

Abdullah Kendoush, Technology Augusta Technical College, USA
Author: Abdullah Kendoush

POSTER SESSION

10:15 AM - 10:35 AM **POSTER SESSION**

FFHMT 177 **Energy Optimization of A Roof Tile Producing Tunnel Kiln by Examining the Kiln Car Physical Properties**

Denny Mathew Alex, Otto von Guericke University Magdeburg , Germany
Authors: Denny Mathew Alex, Tino Redemann, Eckehard Specht

FFHMT 178 **Forecasting of Selected Mechanical Properties of Hybrid Composites**

Ewelina Kosicka, Lublin University of Technology, Poland
Authors: Ewelina Kosicka, Aneta Krzyzak

FFHMT 102 **The Numerical Recalibration Procedure of Water Calibrated CFM for Cryogenic Fluids Application.**

Evgeniia Shavrina, National University of Singapore, Singapore
Authors: Evgeniia Shavrina, Khoo Boo Cheong, Nguyen Vinh Tan

FFHMT 142 **Irradiation-Duration Effect on the Performance of Solar Hot Water Storage Tanks containing Phase Change Material (PCM)**

Abraham Dayan, Tel Aviv University , Israel
Author: Abraham Dayan

FFHMT 133 **Experimental and Numerical Modelling of Condensed Atmospheric Air for Irrigation of Agricultural Crops**

Vitaly Haslavsky, Azrieli College of Engineering, Israel
Authors: Vitaly Haslavsky, Pinchas Doron

8:00 PM - 10:00 PM **BANQUET DINNER** - Niagra West

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The 10th International Conference of Fluid Flow, Heat And Mass Transfer (FFHMT'23)

&

The 7th International Conference of Energy Harvesting, Storage, and Transfer (EHST'23)

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Selected articles from the conferences will be published in the following journal after a secondary review process:

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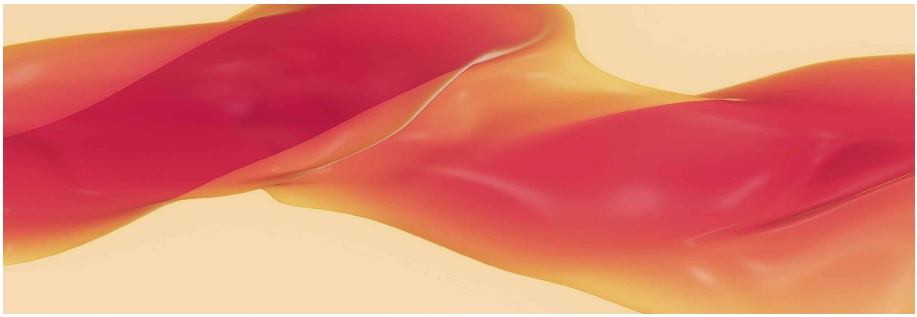

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