

FFHMT
2023

10th International Conference of Fluid Flow, Heat and Mass Transfer

EHST
2023

7th International Conference of Energy Harvesting, Storage, and Transfer



JUNE 07 - 09, 2023

Carleton University, Ottawa, CANADA

Dr. Boguslaw Kruczek
University of Ottawa, Canada

Dr. Wael H. Ahmed
University of Guelph, Canada

Dr. Xianshe Feng
University of Waterloo, Canada

CONFERENCE CHAIR

CONFERENCE CO-CHAIR

CONFERENCE CO-CHAIR

WENSDAY, JUNE 07		09:00 AM Registrations & Networking
		VIRTUAL SESSIONS
		01:00 PM CFD I PAGE 1 & 2
		03:15 PM Session Break
		03:20 PM Fluid Flow & Heat Transfer I - PAGE 2 & 3
THURSDAY, JUNE 08		FRIDAY, JUNE 09
8:00 AM	Registration	KEYNOTE SESSIONS
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	KEYNOTE SESSIONS	09:45 AM EHST'23 PLENARY LECTURE: Dr. Ximing Cai, University of Illinois, USA PAGE 11
9:15 AM	FFHMT'23 KEYNOTE LECTURE: Dr. J.M. Floryan, The University of Western Ontario London, Canada PAGE 4	10:30 AM Coffee Break & Posters Session - PAGE 13
10:00 AM	EHST'23 KEYNOTE LECTURE: Dr. Ursula Eicker, Concordia University, Canada PAGE 5	MORNING SESSIONS
10:45 AM	Coffee Break	10:55 AM CFD IV PAGE 14
11:05 AM	FFHMT'23 KEYNOTE LECTURE: Dr. Nader Masmoudi, New York University Abu Dhabi, UAE PAGE 6	11:40 AM RENEWABLE ENERGY PAGE 15
	MORNING SESSION	12:25 PM Lunch
11:50 AM	CFD II PAGE 7	AFTERNOON SESSIONS
12:50 PM	Group Photo	01:25 PM Energy Storage PAGE 16
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02:45 PM	Heat Transfer Enhancement PAGE 9	03:30 PM MULTIPHASE FLOW & HEAT TRANSFER PAGE 18
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10th INTERNATIONAL CONFERENCE ON FLUID FLOW, HEAT AND MASS TRANSFER (FFHMT'23)

&

7th INTERNATIONAL CONFERENCE OF ENERGY HARVESTING, STORAGE, AND TRANSFER (EHST'23)

JUNE 07 - 09, 2023 | Carleton University, Ottawa, CANADA

The Organizing and Scientific Committees would like to welcome you to the 10th International Conference On Fluid Flow, Heat And Mass Transfer (FFHMT'23) & the 7th International Conference Of Energy Harvesting, Storage, And Transfer (EHST'23).

These International Conferences (FFHMT'23 and EHST'23) 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 Carleton University, Ottawa, Ontario. Ottawa is the capital city of Canada, located on the Rideau Canal and the Ottawa River. 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 10th International Conference of Fluid Flow, Heat and Mass Transfer (FFHMT'23) and the 7th International Conference Of Energy Harvesting, Storage, And Transfer (EHST'23).

We wish you a very successful and enjoyable experience.

Dr. Boguslaw Kruczek
University of Ottawa, Canada
Conference Chair
FFHMT'23 & EHST'23

Dr. Wael H. Ahmed
University of Guelph, Canada
Conference Co-Chair
FFHMT'23 & EHST'23

Dr. Xianshe Feng
University of Waterloo, Canada
Conference Co-Chair
FFHMT'23 & EHST'23

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

The Organizing Committee of the 10th International Conference of Fluid Flow, Heat and Mass Transfer (FFHMT'23) would like to thank the following members for accepting to contribute to the conference.

Scientific Committee Members:

- Dr. Chamil Abeykoon**, The University of Manchester, UK
- Dr. Rayhaneh Akhavan**, University of Michigan-Ann Arbor, USA
- Dr. Majid Bahrami**, Simon Fraser University, Canada
- Dr. Sanjeev Chandra**, University of Toronto, Canada
- Dr. Jiangtao Cheng**, Virginia Tech, USA
- Dr. Lixin Cheng**, Sheffield Hallam University, UK
- Dr. Yan Chen**, Purdue University, USA
- Dr. Yusuf Chisti**, Massey University, New Zealand
- Dr. Sadegh Dabiri**, Purdue University, USA
- Dr. Yulong Ding**, University of Birmingham, UK
- Dr. J.M. Floryan**, The University of Western Ontario, Canada
- Dr. Hui Hu**, Iowa State University, USA
- Dr. Mohamed Hamed**, McMaster University, Canada
- Dr. Hui Hu**, Iowa State University, USA
- Dr. Yogesh Jaluria**, Rutgers University, USA
- Dr. Huan-Jang Keh**, National Taiwan University, Taiwan
- Dr. Nikolai Kozlov**, Institute of Continuous Media Mechanics UrB RAS, Russia
- Dr. Konstantinos Kontis**, University of Glasgow, UK
- Dr. Marcello Iasiello**, Università degli Studi di Napoli Federico II, Italy
- Dr. Gerardo Maria Mauro**, Università degli studi del Sannio, Italy
- Dr. Marc Miscević**, Université Toulouse III – Paul Sabatier, France
- Dr. Robert J. Martinuzzi**, University of Calgary, Canada
- Dr. Mohammad Azizur Rahman**, Texas A&M University at Qatar
- Dr. Karthik Remella**, Ansys, USA
- Dr. Ziad Saghir**, Toronto Metropolitan University, Canada
- Dr. Ahmet Selamet**, The Ohio State University, USA
- Dr. Lian Shen**, University of Minnesota, USA
- Dr. Jules Thibault**, University of Ottawa, Canada
- Dr. Junfeng Zhang**, Laurentian University, USA

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

The Organizing Committee of the 7th International Conference of Energy Harvesting, Storage, and Transfer (EHST'23) would like to thank the following members for accepting to contribute to the conference.

Scientific Committee Members:

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

Dr. Aicheng Chen, University of Guelph, Canada

Dr. Akhtar Hussain, University of Alberta, Canada

Dr. Lin Liu, The University of Kansas, USA

Dr. Sylvie Lorente, INSA Toulouse, France

Dr. Amir H Mohammadi, University of KwaZulu-Natal, South Africa

Dr. Sebastien Poncet, University of Sherbrooke, Canada

Dr. SA Sherif, University of Florida, USA

Dr. Ali Tarokh, Lakehead University, Canada



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7:00 AM - 8:00 AM		Registration
		VIRTUAL SESSIONS
01:00 PM - 03:15 PM		CFD I
		SESSION CHAIR: Dr. Wael H. Ahmed, University of Guelph, Canada & Dr. Anamika Maurya, Ahmedabad University, India
FFHMT 110	01:00 - 01:15	Heat Transfer Analysis of a Crossflow Minichannel Heat Exchanger Based on Air and Liquid Flow Implementing PCM as Latent Heat Thermal Energy Storage <i>Saman Jalilian, University of Windsor, Canada</i> <i>Authors:</i> Mahdi Momeni, Saman Jalilian, Amir Fartaj
FFHMT 144	01:15 - 01:30	Analysis of Local and Overall Volumetric Mass Transfer Coefficients in a Dual Coaxial Mixer containing a Yield-pseudoplastic Fluid <i>Forough Sharifi, Ehsan Behzadfar, Farhad Ein-Mozaffari</i> <i>Authors:</i> Forough Sharifi, Toronto Metropolitan University, Canada
FFHMT 145	01:30 - 01:45	CFD Modeling of Gas Dispersion in Yield-Pseudoplastic Solutions Driven by Coaxial Mixers: Effect of Rotating Approach <i>Paloma L. Barros, Toronto Metropolitan University, Canada</i> <i>Authors:</i> Paloma L. Barros, Farhad Ein-Mozaffari, Ali Lohi
FFHMT 148	01:45 - 02:00	Mass transfer and Shear Environment of an Aerated Coaxial Mixer Containing a Shear-thinning Fluid <i>Ali Rahimzadeh, Toronto Metropolitan University, Canada</i> <i>Authors:</i> Ali Rahimzadeh, Farhad Ein-Mozaffari, Ali Lohi
FFHMT 114	02:00 - 02:15	Application of Particle Image Velocimetry (PIV) on Newtonian and Two-phase Slurry Flow through the Annulus <i>Mohammad Azizur Rahman, Texas A&M University at Qatar, Qatar</i> <i>Authors:</i> Muhammad Usman Siddiqui, Mohammad Azizur Rahman
FFHMT 158	02:15 - 02:30	Benchmark Of Models Commonly Used To Simulate Laser-Induced Incandescence Of Soot <i>Sébastien Menanteau, École de technologie supérieure, Canada</i> <i>Authors:</i> Romain Lemaire, Sébastien Menanteau

FFHMT 136	The Effect of Nanoparticle Aggregation on the Radiative Properties of Plasmonic Nanofluid during Light-induced Vaporization Process
02:30 - 02:45	<i>Yifan Zhang, Tongji University, China</i> <i>Authors:</i> Yifan Zhang, Wei An, Chang Zhao, Qingchun Dong
FFHMT 174	Thermal-Hydraulic Behaviour Comparison of Two Novel Lattice Structures with Simple Cubic BCC Lattice Structure
02:45 - 03:00	<i>Abhishek Dey, Indian Institute of Technology Madras, India</i> <i>Authors:</i> Abhishek Dey, V. Raghavan, G. Venkatarathnam
FFHMT 191	Polymeric Hollow Fiber Heat Exchangers for Automotive Applications
03:00 - 03:15	<i>Erik Bartuli, Brno University of Technology, Czech Republic</i> <i>Authors:</i> Erik Bartuli, Jan Bohacek, Krystof Mraz, Jiri Hvozda
03:15 PM - 03:20 PM	SESSION BREAK
03:20 PM - 05:50 PM	Fluid Flow & Heat Transfer I SESSION CHAIR: Dr. Wael H. Ahmed, University of Guelph, Canada & Dr. Mohammad Azizur Rahman, Texas A&M University at Qatar, Qatar
FFHMT 163	Averaged Convection In A Flat Layer At Modulated Rotation Around A Horizontal Axis
03:20 - 03:35	<i>Kirill Rysin, Perm State Humanitarian-Pedagogical University, Russia</i> <i>Author:</i> Kirill Rysin
FFHMT 146	Dynamics of a Rotating Core-Annular Flow at Inertial Fluid Oscillations
03:35 - 03:50	<i>Nikolai Kozlov, Perm State Humanitarian Pedagogical University, Russia</i> <i>Authors:</i> Olga Vlasova, Ivan Karpunin, Nikolai Kozlov
FFHMT 147	Thermal “Vibrational” Convection in Thick Rotating Horizontal Annulus
03:50 - 04:05	<i>Aleksey Vjatkin, Perm State Humanitarian Pedagogical University, Russia</i> <i>Authors:</i> Aleksey Vjatkin, Rustam Sabirov, Victor Kozlov
FFHMT 105	Photothermal Convergence Performance of Mono and Hybrid Nanofluids in Solar Systems
04:05- 04:20	<i>Roy J. Issa, West Texas A&M University, USA</i> <i>Authors:</i> Roy J. Issa

FFHMT 131 Effect of Location of Rectangular Orifice on the Momentum Flow of Power-law Fluids

04:20 - 04:35 *Anamika Maurya, Ahmedabad University, India*
Authors: Anamika Maurya, Rajendra Chhabra

EHST 112 Photovoltaic Thermal Energy Storage System for Hybrid DHW in Single-Family Buildings

04:35 - 04:50 *Shi Xingyi, The Hong Kong Polytechnic University, China*
Authors: Xingyi Shi, Xiaoyu Huo, Liang An

EHST 119 Study of the Influence of Rock Mechanical Parameters on the Wellbore Stability under Depleted Reservoir Condition

04:50 - 05:05 *Arnaud Regis Kamgue Lenwoue, Yangtze University, China*
Authors: Zhonghui Li, Arnaud Regis Kamgue Lenwoue, Xuesong Xing, Pengjie Hu, Wentie Sun, Shi Ding

EHST 113 Flexible Nanogenerators based on Piezoelectric PVDF-TrFE Nanocomposites Poled by DC Magnetic Field

05:05 - 05:20 *Marco Fortunato, Sapienza University of Rome, Italy*
Authors: Marco Fortunato, Alessio Tamburrano and Maria Sabrina Sarto

FFHMT 194 Applications of Water Injection using Power Dump Flood Technology and Energy Optimization

05:20 - 05:35 *Mohamed Abd ElHady Ali Elembaby, Khaldia petroleum company JV (EGPC & Appachi houston ,Texas), Egypt*
Authors: Mohamed Abd ElHady Ali Elembaby

EHST 114 Numerical Modelling of a Phase Change Material-based Shell and Tube Thermal Energy Storage Unit

05:35 - 05:50 *Mansoureh Khaljani, Cardiff University, UK*
Authors: Mansoureh Khaljani, Arslan Saleem, Hector Bastida, Jose Munoz Criollo, Carlos E. Ugalde-Loo, Robert Smart, Nick Jenkins

8:00 AM - 9:00 AM

Registration

09:00 AM - 09:15 AM

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

09:15 AM - 10:00 AM

FFHMT'23 KEYNOTE LECTURE - PHYSICAL**SESSION CHAIR:** Dr. Boguslaw Kruczek, University of Ottawa, Canada**Electrical Effects in Liquid Droplets***Dr. J.M. Floryan,**The University of Western Ontario London, Canada*

Dr. Floryan is currently a Professor in the Department of Mechanical and Materials Engineering. He received an M.Sc degree from the Warsaw Technical University (Poland) in 1974, PhD from Virginia Tech (USA) in 1980, and went through postdoctoral training at the Northwestern University (USA) in 1981. He specializes in fluid mechanics, with analysis and simulations as the primary methodologies. His current interests are focused on the development of flow manipulation strategies with applications across all flow regimes.

Dr. Floryan held visiting appointments at the German Aerospace Research Establishment (DLVR, Gottingen), French Aerospace Research Establishment (ONERA, Toulouse), Japanese National Aerospace Laboratory (NAL, Tokyo), National University of Singapore (Singapore), Beijing Institute of Technology (China), Stuttgart University (Germany), Darmstadt University (Germany), Technion (Israel), City University (Hong Kong), Ohio University (USA), Tokyo Metropolitan University (Japan), University of Canterbury (New Zealand). He is Fellow of the American Physical Society, American Society of Mechanical Engineers, Canadian Society for Mechanical Engineering, Canadian Aeronautics and Space Institute, Engineering Institute of Canada as well as STA Fellow (Japan), Humboldt Fellow (Germany), Japanese Society for the Promotion of Science Fellow (Japan) and Senior NATO Research Fellow (France). He is recipient of the Humboldt Research Prize in Germany.

EHST'23 KEYNOTE LECTURE - PHYSICAL

10:00 AM - 10:45 AM

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



On The Role of Thermal Storage for Demand Response in Building Clusters

*Dr. Ursula Eicker,
Concordia University, Canada*

Prof. Ursula Eicker is the Canada Excellence Research Chair (CERC) in Smart, Sustainable and Resilient Cities and Communities at Concordia University Montréal. A German physicist, Eicker has held leadership positions at the Stuttgart University of Applied Sciences and its Centre for Sustainable Energy Technologies. She coordinated many international research projects in the fields of building energy efficiency, renewable energy systems and urban scale simulation. Since June 2019, she leads an ambitious research program to establish transformation strategies toward zero-carbon cities. Around 50 graduate students work on decarbonisation pathways in the domains of the built environment, renewable energy systems, sustainable transport and circular economy. An urban data analysis and modeling framework integrates the multidisciplinary work. The 7 year research program received 10 million CAD government funding and is supported by a further 10 million Dollars by Concordia University.

10:45 AM - 11:05 AM

COFFEE BREAK

11:05 PM - 11:50 PM

EHST'23 KEYNOTE LECTURE - PHYSICAL**SESSION CHAIR:** Dr. Boguslaw Kruczek, University of Ottawa, Canada**Reversal in the Stationary Prandtl Equations**

*Dr. Nader Masmoudi,
New York University Abu Dhabi, UAE*

Nader Masmoudi received his BS in Mathematics from the École Normale Supérieure Paris in 1996, his PHD from Paris Dauphine University in 1999 and his HDR in 2000. He was a CNRS researcher from 1998 till 2000. Since 2000, he is a Professor at the Courant Institute of Mathematical Sciences at New York University. He is currently spending few years at NYUAD in Abu Dhabi as an affiliated faculty where he is the director of the center Stability, Instability and weak turbulence. His research lies in the interface between fluid mechanics, partial differential equations and dynamical system. His honors include a gold medal at the International Mathematic Olympiads in 1992, a Sloan Fellowship from 2001 to 2003, a Senior Clay Math Scholar in 2014, a chair of excellence from the Foundation Sciences Mathématiques de Paris from 2016 to 2018, a chair position from the Institut des hautes études scientifiques in Paris from 2018 to 2020. He was the recipient of the Fermat prize in 2017, of the Kuwait prize in 2019 of the King Faisal Prize in Sciences in 2023. He was elected to the the American Academy of Arts and sciences in 2021.

MORNING SESSION	
11:50 AM - 12:50 PM	CFD II
	SESSION CHAIR: Dr. Boguslaw Kruczek, University of Ottawa, Canada & Dr. Abdullah Kendoush, Augusta Technical College, USA
FFHMT 108 11:50 - 12:05	A Numerical Study of Unsteady Natural Convection from Two-Sided Thin Horizontal Isothermal Plates <i>Koustav Bandyopadhyay, Queen's University, Canada</i> <i>Authors:</i> Koustav Bandyopadhyay, Patrick H. Oosthuizen, Qingguo Li
FFHMT 112 12:05 - 12:20	A CFD Analysis of Energy Separation of Rectangular Shape Cold Orifice Vortex Tube <i>A.D. Parekh, SVNIT, India</i> <i>Authors:</i> Nitin Bagre, A.D. Parekh, V.K. Patel
FFHMT 113 12:20 - 12:35	Development and Validation of an N-Dodecane Skeletal Mechanism Using a Hybrid Reduction Method in a Jet Stirred Reactor <i>Anurag Dahiya, National Tsing Hua University, Taiwan</i> <i>Authors:</i> Anurag Dahiya, Kuang C. Lin
FFHMT 115 12:35 - 12:50	Viscous Dissipation Inside Electric Motors <i>Ahmed M. Teamah, McMaster University, Canada</i> <i>Authors:</i> Ahmed M. Teamah, Mohamed S. Hamed
12:50 PM - 12:55 PM	GROUP PHOTO
12:55 PM - 01:45 PM	LUNCH BREAK

AFTERNOON SESSIONS

01:45 PM - 02:45 PM

CFD III

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

FFHMT 165
01:45 - 02:00

Comparison of PCM Mediums for Hybrid Thermal Management of Electric Battery Packs

Seham Shahid, Ontario Tech University, Canada
Authors: Seham Shahid, Martin Agelin-Chaab

FFHMT 170
02:00 - 02:15

Simulating the Permeation of Hazardous Chemicals through Barrier Materials

Alex Bicket, University of Ottawa, Canada
Authors: Alex Bicket, Vivian Lau and Jules Thibault

FFHMT 172
02:15 - 2:30

Numerical Study Of Transverse Pitch Effect On Pressure Loss In An Inline Array Of Elliptical Pins

Justina Jaseliūnaitė, Lithuanian Energy Institute, Lithuania
Authors: Justina Jaseliūnaitė, Marijus Šeporaitis

FFHMT 173
02:30 - 02:45

Effects of Geometrical Parameters on Thermal-Hydraulic performance of air flowing in Additively Manufacturable Heat Exchanger

Chaitanya Kishore C, IIT Madras, India
Authors: C. Chaitanya Kishore, V. Raghavan, G. Venkatarathnam

02:45 PM - 03:45 PM

Heat Transfer Enhancement

SESSION CHAIR: Dr. James Arthur, Bucknell University, USA

- FFHMT 106
02:45 - 3:00

Numerical Shape Optimization Of A Manifold Mini-Channel For Battery Thermal Management Of Electric Vehicles

Seonwoong Byun, Korea University, South Korea

Authors: Seonwoong Byun, Sewon Lee, Hyun Ho Shin, Yongchan Kim
- FFHMT 107
03:00 - 3:15

Numerical Study on Heating Performance Characteristics of a Heat Pump System Recovering Battery Heat for Electric Vehicles

Hyejun You, Korea University, South Korea

Authors: Hyejun You, Se Hyeon Ham, Yongchan Kim
- FFHMT 123
3:15 - 3:30

Improvement in Energy Performance of a HVAC System Working with Nanofluid

Marco Milanese, University of Salento, Italy

Authors: Marco Milanese, Marco Potenza, Claudio Grisoni, Arturo de Risi
- FFHMT 125
3:30 - 3:45

Single Augmented Swirling and Round Jet for Improvement of Impingement Heat Transfer from a Flat Plate

Premchand V Chandra, Interdisciplinary Centre for Energy Research (ICER), India

Authors: Premchand V, Gopakumar R, Pratikash P Panda, Pradip Dutta

03:45 PM - 04:00 PM

COFFEE BREAK

AFTERNOON SESSION

Experimental, Fluid Flow & Heat Transfer

04:00 PM - 05:15 PM

SESSION CHAIR: Dr. Wael H. Ahmed, University of Guelph, Canada & Dr. Sirisha Parvathaneni, ArcelorMittal Global Research and Development, USA

FFHMT 126

Insights for Modelling Turbulence in a Backward-Facing Step Flow in a Narrow Channel

04:00 - 04:15

James K. Arthur, Buckenell University, USA
Authors: James K. Arthur

FFHMT 159

Quenching Of Moving Aluminum Sheets In Fields Of Flat-And Full-Jet Nozzles

04:15 - 04:30

Bilal Mehdi, Otto von Guericke University Magdeburg, Germany
Authors: Stephan Ryll, Bilal Mehdi, Eckehard Specht

FFHMT 171

Hydrodynamic Profiles Of Computed Tomography-Scanned Polydispersed Beds Produced By Sieving

04:30 - 04:45

Stylianios Kyrimis, University of Southampton, UK
Authors: Stylianios Kyrimis, Robert Raja, Lindsay-Marie Armstrong

FFHMT 177

Polymer Hollow Fiber Oil Cooler for a Racing Car

04:45 - 05:00

Filip Lang, Brno University of Technology, Czech Republic
Authors: Filip Lang

FFHMT 178

Comparison of the Compliance and Deformation Properties of PDMS and NOA Microfluidic Chips

05:00 - 05:15

Tatiana Turcitu, University of Ottawa, Canada
Authors: Tatiana Turcitu, Curtis J.K. Armstrong, Niko Lee-Yow, Andy Vinh Le1, Marianne Fenech

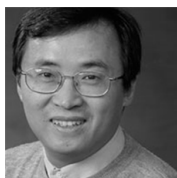
09:00 AM - 09:45 AM

FFHMT'23 KEYNOTE LECTURE**SESSION CHAIR:** Dr. Wael H. Ahmed, University of Guelph, Canada**Aircraft/Aeroengine Icing Physics and Innovative Strategies for Inflight Icing Mitigation**

*Dr. Hui Hu,
Iowa State University, USA*

Dr. Hui Hu is the Martin C. Jischke Professor at Department of Aerospace Engineering, Iowa State University. He received his BS, MS and PhD degrees in Aerospace Engineering from Beijing University of Aeronautics and Astronautics (BUAA) in China, and a PhD degree in Mechanical Engineering from the University of Tokyo in Japan. His recent research interests include advanced optical/laser-based diagnostics, aircraft/aero-engine icing and anti-/de-icing technology; wind energy and wind turbine aeromechanics; Fluid-Structure Interactions (FSI) of built structures in violent windstorms (e.g., tornadoes, downbursts, and snowstorms). Dr. Hu is an ASME Fellow and AIAA Associate Fellow. He is serving as an editor of “Experimental Thermal and Fluid Science-Elsevier” and an associate editor of “ASME Journal of Fluid Engineering” and “ASME Open Journal of Engineering”. Dr. Hu received several prestigious awards in recent years, including 2006 NSF-CAREER Award, 2007 Best Paper in Fluid Mechanics Award (Measurement Science and Technology, IOP Publishing), 2009 AIAA Best Paper Award in Applied Aerodynamics, 2012 Mid-Career Achievement in Research Award of Iowa State University, 2013 AIAA Best Paper Award in Ground Testing Technology, 2014 Renewable Energy Impact Award of Iowa Energy Center, and 2023 AIAA Gas Turbine Best Paper Award. Further information about Dr. Hu’s technical background and research activities is available at: <http://www.aere.iastate.edu/~huhui/>

09:45 AM - 10:30 AM

EHST'23 PLENARY LECTURE**SESSION CHAIR:** Dr. Wael H. Ahmed, University of Guelph, Canada**Stakeholder Synergy for Cellulosic-based Bioeconomy in the United States***Dr. Ximing Cai,
University of Illinois, USA*

Professor Ximing Cai is a leading scholar in environmental sustainability assessment with biofuel development. Cai group published the first paper on global marginal land availability assessment for biomass production (Cai et al. 2004; Environ. Sci. and Technology – EST, doi:10.1021/es103338e) and a recent paper on water requirement and availability for biorefinery in the United States (Yang et al. 2023, EST, doi: 10.1021/acs.est.1c07747). Besides resources availability assessment, he has also worked on infrastructure requirement for regional biofuel development (Housh et al. 2014, J. of Infra. Sys. doi:10.1061/(ASCE)IS.1943-555X.0000238). Recently, Cai group has analyzed the stakeholders' synergy for bioeconomy (Leibensperger, et al. 2021 doi: 10.1016/j.rser.2020.110613) and developed a bioenergy community communication model – an agent-based model simulating the behaviors and interactions among multiple stakeholders including biomass producers, refinery industries, rural communities, government agencies, and NGOs (Yang et al. 2023, Renew. & Sust. En. Rev., doi: 10.1016/j.rser.2023.112745). He served as Section Editor, Biofuel, Current Sustainability/Renewable Energy Reports, 2014. He is elected Fellow of Am. Geo. Union (AGU) and the 2023 awardee of Am. Sco. of Civil Engineers (ASCE) Julian Hinds Award. He has worked as consultant to the World Bank, United Nations, and other international agencies. Before joining the faculty of the University of Illinois in 2003, Professor Cai was Research Fellow at the International Food Policy Research (IFPRI) Institute in Washington, D.C. He holds B.S. in Water Resources Engineering (1990) and M.S. in Hydrology and Water Resources (1994) from Tsinghua University, Beijing, and Ph.D. in Water Resources Engineering (1999) from the University of Texas at Austin.

10:30 AM - 10:55 AM	COFFEE BREAK
10:30 AM - 10:55 AM	Posters Session SESSION CHAIR: Dr. Wael H. Ahmed, University of Guelph, Canada

FFHMT 181	Hypervapotron High Heat Flux Cooling Numerical and Experimental Study <i>Vojtěch Smolík, Institute of Plasma Physics of the Czech Academy of Sciences, Czech Republic</i> <i>Authors:</i> Vojtěch Smolík, Miroslav Gleitz, Slavomír Entler, Pavel Zácha
FFHMT 182	1D Modelling of Printed Circuit Heat Exchanger for Demo Fusion Power Plant <i>Matyáš Junek, CTU, Czech Republic</i> <i>Authors:</i> Matyáš Junek, Jan Štěpánek, Guk Chol Jun, Pavel Záchal, Slavomír Entler
FFHMT 183	The Design of the Scaled-down Experimental Device for Molten Salts <i>Michal Cihlář, Czech Technical University in Prague, Czech Republic</i> <i>Authors:</i> Michal Cihlář, Slavomír Entler, Pavel Zácha, Václav Dostál, Jan Prehradný, Jakub Špaček
EHST 123	Biomass Waste to Energy for a Particleboards Industry <i>Filimon Gebreeyesus, Tigray Institute of Policy, Ethiopia</i> <i>Authors:</i> Tesafaldet Gebreegziabher, Filimon Gebreeyesus

MORNING SESSIONS	
	CFD IV
10:55 AM - 11:40 PM	SESSION CHAIR: Dr. Abdullah Kendoush, Augusta Technical College, USA
FFHMT 175 10:55 - 11:10	CFD Study Of Boss Fins' Effect On Performance Of Marine Propellers <i>Akshat Verma, Indian Institute of Technology Bombay, India</i> <i>Authors:</i> Akshat Verma, Mohit Kapoor, Neeraj Kumbhakarna
FFHMT 166 11:10 - 11:25	Thermal Performance Assessment of Reformed Gas Combustion in O₂ Injection Lance <i>Sirisha Parvathaneni, ArcelorMittal Global Research and Development, USA</i> <i>Authors:</i> Sirisha Parvathaneni, Marcelo Andrade, Dmitri Boulanov
FFHMT 121 11:25 - 11:40	Computational Study of Taylor Bubble Drift Velocity in Inclined Multiphase Flow <i>Ibrahim Ahmed, University of Leeds, UK</i> <i>Authors:</i> Ibrahim Ahmed
	Renewable Energy
11:40 AM - 12:25 PM	SESSION CHAIR: Dr. Sirisha Parvathaneni, ArcelorMittal Global Research and Development, USA

EHST 111
11:40 - 11:55

A Bifunctional Electrochemical Flow Cell Integrating Ammonia Production and Electricity Generation

Zhefei Pan, The Hong Kong Polytechnic University, Hong Kong

Authors: Zhefei Pan, Yun Liu, Liang An

EHST 120
11:55 - 12:10

Deep Learning-Based Models for Wind and Solar Curtailment Forecasting

Hengameh Hadian, Concordia Univeristy, Canada

Authors: Hengameh Hadian, Farnoosh Naderkhani

FFHMT 111
12:10 - 12:25

Improvement of Syngas Quality in Fixed Bed Gasifier Using CaMg(CO3)2 Catalyst

Darshit S Upadhyay, Nirma University, India

Authors: Darshit S Upadhyay, Amita Chaudhary, Akshit Trada, Dhruvil Patel, Rajesh N Patel

12:25 PM - 01:25 PM	LUNCH BREAK
AFTERNOON SESSIONS	

Energy Storage

01:25 PM - 02:25 PM

SESSION CHAIR: Dr. Sirisha Parvathaneni, ArcelorMittal Global Research and Development, USA

EHST 110 **Online State-Estimation of Lithium-Ion Battery's Operational States Using the Electrochemical Model Based Nonlinear Kalman Filter**

01:25 - 01:40

Pouya Hashemzadeh, Université de Sherbrooke, Canada
Authors: Pouya Hashemzadeh, Martin Désilets, Marcel Lacroix

EHST 117 **Free Standing Mixed Matrix Membranes for Carbon Capture**

01:40 - 01:55

Suboohi Shervani, University of Ottawa, Canada
Authors: Suboohi Shervani, Lara P. Tansug, F. Handan Tezel

EHST 121 **Vermiculite/LiCl Composite for Adsorption Thermal Energy Storage**

01:55 - 02:10

Suboohi Shervani, University of Ottawa, Canada
Authors: Suboohi Shervani, Curtis Strong, F. Handan Tezel

EHST 122 **Photovoltaic Thermal Energy Storage System for Hybrid DHW in Single-Family Buildings**

02:10 - 02:25

Mohamed R. H. Abdel-Salam, Enbridge Gas Inc, Canada
Authors: Mohamed R. H. Abdel-Salam, Matt Cable

02:25 PM - 03:10 PM		CFD V
		SESSION CHAIR: Dr. Abdullah Kendoush, Augusta Technical College, USA
FFHMT 138 02:25 - 02:40	Predictions of Dynamic property for Gas Foil Bearings Based on Multi-physics Three-dimensional Model of Computer Aided Engineering Simulations <i>Tai Yuan Yu, National Tsing Hua University, Taiwan</i> <i>Authors:</i> Tai Yuan Yu, Pei Jen Wang	
FFHMT 139 02:40 - 02:55	Numerical Modelling of Off-gases during Carbonization of Carbon Fibers <i>Ik-Tae Im, Jeonbuk National University, Republic of Korea</i> <i>Authors:</i> Min-Woo Kim, Dong Guk Ko, Gyo Woo Lee, Ik-Tae Im	
FFHMT 164 02:55 - 03:10	Comparison of Hybrid Cooling Concepts for Electric Battery Packs <i>Seham Shahid, Ontario Tech University, Canada</i> <i>Authors:</i> Seham Shahid, Martin Agelin-Chaab	
03:10 PM - 03:30 PM		COFFEE BREAK

AFTERNOON SESSION

Multiphase Flow & Heat Transfer

03:30 PM - 05:15 PM

SESSION CHAIR: Dr. Darshit Shaileshkumar Upadhyay,
Nirma University, India

FFHMT 132 Multiphase Flow Modelling Using Surrogate Model

03:30 - 03:45

Agata Widuch, Silesian University of Technology, Poland

Authors: Agata Widuch, Kari Myöhänen, Markku Nikku, Alessandro Parente,
Wojciech Adamczyk

FFHMT 156 The Fluid Dynamics of Rising and Evaporating Droplet in an
03:45 - 04:00 Immiscible Liquid

Abdullah Abbas Kendoush, Augusta Technical College, USA

Authors: Abdullah Abbas Kendoush

FFHMT 169 Experimental Investigation of Double Pipe Heat Exchangers for
04:00 - 04:15 Cryogenic Applications

Mu-An Tsai

Authors: Mu-An Tsai, Liang-Han Chien, Chih-Yuan Lo

FFHMT 161 Flow boiling heat transfer of R134a: Effect of heat flux and Dry-out
04:15 - 04:30 characteristics

Ernest Gyan Bediako, Technical University of Liberec, Czech Republic

Authors: Ernest Gyan Bediako, Petra Dancova, Anas F. A. Elbarghthi, Tomas Vit

FFHMT 180 A Study on the Heat Transfer Characteristics of Semi- Flooded Type
04:30 - 04:45 Evaporator Fin Tube for Adsorption Chiller

Sehyun Noh, Jeonbuk National University, South Korea

Authors: Sehyun Noh, Van Cong Le , Huynh Tan Loc, Van Hau Duong, Chan
Woo Park

FFHMT 179 Evaluating Two-Phase Flow Patterns in Airlift pumps Using Image
04:45 - 05:00 Processing Technique

Dana Fadlalla, University of Guelph, Canada

Authors: Dana Fadlalla, Wael H. Ahmed, David Weales, Medhat Moussa

FFHMT 193 Carbon Dioxide Capture Using Airlift Pumps

05:00 - 05:15

Alexander Doucette, University of Guelph, Canada

Authors: Alexander Doucette, Cora R. Dickie-Wilson, Shahriyar G. Holagh, Wael
H. Ahmed

07:00 PM - 09:00 PM

GALA DINNER - CARLETON UNIVERSITY

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The 11th International Conference of Fluid Flow, Heat And Mass Transfer (FFHMT'24)

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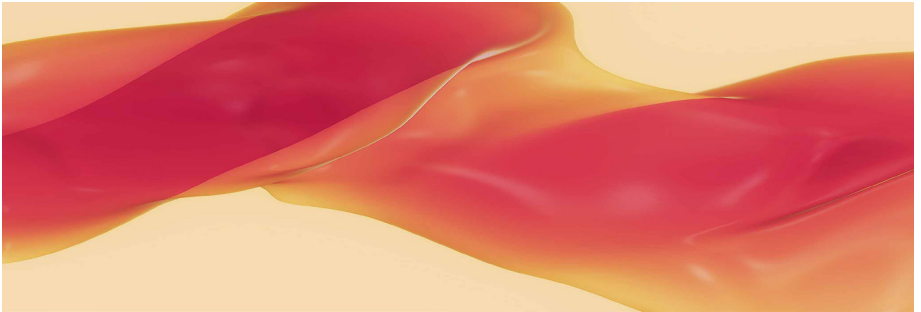
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