



**ICFFTS**  
2020

**INTERNATIONAL CONFERENCE ON FLUID  
FLOW AND THERMAL SCIENCE  
(ICFFTS'20)**

**September 9 - 10, 2020 | Virtual Conference**

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# WELCOME MESSAGE FROM THE CONFERENCE CHAIR

**On behalf of the International Academy of Science, Engineering and Technology (International ASET Inc.), the organizing committee would like to welcome you to the International Conference on Fluid Flow and Thermal Science (ICFFTS'20).**

The goal of ICFFTS'20 is to provide an online space for scholars from all over the world to present advances in the relevant fields and to foster a virtual environment conducive to exchanging ideas and information. This conference will also provide an ideal environment to develop new collaborations and meet experts on the fundamentals, applications, and products of the mentioned fields.

In the first meeting of this conference, five keynote speakers will share their expertise with the aim of exposing participants to a wide spectrum of applications, and to foster crosspollination of ideas and develop new research interests. In addition, approximately 10 papers will be presented from professors, students, and researchers across the world.

We thank you for your participation and contribution to the International Conference on Fluid Flow and Thermal Science (ICFFTS'20). We wish you a very successful and enjoyable experience.

**Dr. Boguslaw Kruczek**  
**University of Ottawa, Canada**  
*Conference Chair*  
*ICFFTS'20*

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# ABOUT ICFFTS'20

**The International Conference on Fluid Flow and Thermal Science (ICFFTS'20) aims to become the leading virtual conference in fields related to fluid flow and heat transfer.** The goal of ICFFTS'20 is to provide an online space for scholars from all over the world to present advances in the relevant fields and to foster a virtual environment conducive to exchanging ideas and information.

ICFFTS'20 is an international conference will be held yearly. This conference focus on all aspects Fluid Flow and Thermal Science. ICFFTS'20 Will be held this year in VIRTUAL conference

**ICFFTS'20** is an acronym for **I**nternational **C**onference, on **F**luid **F**low and **H**eat **T**ransfer.

The proceedings are published in Ottawa, Canada.

- All papers were peer-reviewed
- The conference proceedings is published under an ISSN and ISBN number
- Each paper is assigned a unique DOI number by [Crossref](#)
- The conference proceedings is indexed by [Google Scholar](#)
- The proceedings is permanently archived in [Portico](#) (one of the largest community-supported digital archives in the world)

 Google Scholar

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# SCIENTIFIC COMMITTEE

We would like to thank the following for accepting to act as a member of the Scientific Committee for the ICFFTS'20 Conference:



**Dr. Boguslaw Kruczek**

**University of Ottawa, Canada**  
Conference Chair

## Scientific Committee Members

- **Dr. Thomas Adams**, Rose-Hulman Institute of Technology, USA
- **Dr. Chamil Abeykoon**, The University of Manchester, UK
- **Dr. Yan Chen**, Purdue University, USA
- **Dr. Jivtesh Garg**, University of Oklahoma, USA
- **Dr. Mohammad Hojjat**, University of Isfahan, Iran
- **Dr. Darrell Pepper**, University of Nevada, Las Vegas, USA
- **Dr. Sébastien Poncet**, Sherbrooke University, Canada
- **Dr. Sergei Sazhin**, University of Brighton, UK
- **Dr. Sunmi Shin**, National University of Singapore, Singapore

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# KEYNOTE SPEAKERS

The keynote information for the International Conference on Fluid Flow and Thermal Science (ICFFTS'20) is as follows:



**Dr. Chamil Abeykoon**  
The University of Manchester, UK



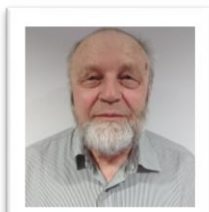
**Dr. Thomas Adams**  
Rose-Hulman Institute of Technology, USA



**Dr. Jivtesh Garg**  
University of Oklahoma, USA



**Dr. Mohammad Hojjat**  
University of Isfahan, Iran



**Dr. Sergei Sazhin**  
University of Brighton, UK

# KEYNOTE LECTURE



**Title:** Soft sensing and fuzzy logic based control for industrial processes

Dr. Chamil Abeykoon, The University of Manchester, UK

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Chamil Abeykoon received the B.Sc. (Hons.) degree in mechanical engineering from the University of Peradeniya, Sri Lanka, in 2007, with the award of best performance in mechanical engineering, and the Ph.D. degree in mechanical engineering from the Queens University Belfast, U.K., in 2011, with several publications, in which one of his publications received the Young Author Best Paper Award from the IEEE in 2011. After completing the Ph.D. degree, he briefly worked as a Lecturer in Mechanical Engineering with the University of Peradeniya, Sri Lanka, a Research Fellow with the University of Bradford, U.K., and a Lecturer of Engineering with the Glyndwr University, U.K., before joining the UoM. He is currently with the Faculty of Science and Engineering, School of Materials, University of Manchester (UoM). He is working mainly with the Northwest Composts Centre and the Aerospace Research Institute, and supervising research students affiliated with the School of Materials, UoM, and the School of Mechanical and Aerospace Engineering, UoM. So far, he has authored 60+ peer-reviewed journals/conference papers. Moreover, he has authored a monograph, "Polymer Extrusion: A Study on Thermal Monitoring Techniques and Melting Issues." His current research interests include: process monitoring, modeling, and control; soft sensors and soft sensing; process instrumentation; renewable energy technologies; 3D printing, phase change materials; and heat transfer.

Form more information Please visit:

[https://avestia.com/ICFFTS2020\\_Proceedings/files/speakers.html](https://avestia.com/ICFFTS2020_Proceedings/files/speakers.html)

# KEYNOTE LECTURE



**Title:** Generalist Scholarship and Engineering Education

Dr. Thomas Adams, Rose-Hulman Institute of Technology, USA

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Thomas Adams (or “Dr. Thom” as his students call him) received his BS in mechanical engineering from Rose-Hulman Institute of Technology, USA and his MS and PhD in mechanical engineering from Georgia Institute of Technology, USA. Currently the Herman A. Moench Distinguished Professor of Mechanical Engineering at Rose-Hulman Institute of Technology, he has taught over fourteen different courses and is one of a very small number of faculty to receive both the Institute’s Outstanding Teacher and Outstanding Scholar Awards. He has won best paper awards for his work in engineering education and technical research alike. The topic of his dissertation concerned single-phase and two-phase heat transfer in microchannels, representing some of the seminal work in the field. He has since become a leading educator in the field of micro-electro-mechanical systems (MEMS) and has authored a first of its kind textbook on the subject, aimed at an audience of undergraduate technical majors, regardless of their particular field. His current research focuses on what he calls “generalist scholarship,” in which physical systems and processes are purposely modeled using the most fundamental concepts and methods available in order to ascertain physical trends and correlations that often go unnoticed.



# KEYNOTE LECTURE



**Title:** Strain Tuning High Thermal Conductivity In Semiconductors And Polymers

Dr. Jivtesh Garg, University of Oklahoma, USA

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Dr. Jivtesh Garg is an Associate Professor in the School of Aerospace and Mechanical Engineering at University of Oklahoma. His work focuses on design of semiconductor and polymer materials for thermal management and energy conversion applications. He obtained his Ph.D from Massachusetts Institute of Technology (MIT), Cambridge in 2011. Before that he performed research in the field of thermal management at General Electric, Research and Development at Niskayuna, NY. He obtained his Masters from University of Minnesota in 2002. He is the recent recipient of NSF CAREER award.

# KEYNOTE LECTURE



**Title:** Nanofluids: Applications and Challenges  
Dr. Mohammad Hojjat, University of Isfahan, Iran

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Mohammad Hojjat is an Assistant professor of chemical engineering department at University of Isfahan (UI-Iran). Dr. Hojjat received his B.Sc. and M.Sc. degrees in chemical Engineering from Sharif University of Technology (Tehran, Iran). He obtained his PhD from Isfahan University of Technology in 2010. Dr. Hojjat has published about 22 refereed journal papers and about 30 conference proceeding papers. Dr. Hojjat's researches focuses on Transport Phenomena in Nanofluids, Adsorption, and Computational Intelligence in Chemical Engineering.

# KEYNOTE LECTURE



**Title:** Droplet Heating and Evaporation: Recent Developments of Simple Models of Complex Processes

[Dr. Sergei Sazhin, University of Brighton, UK](#)

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Professor Sergei Sazhin received his PhD (Physics) from St Petersburg State University (Russia) in 1977. Currently, he is working as Professor of Thermal Physics at the University of Brighton (UK). He has developed and delivered lecture courses in many subjects including Advanced Computational Fluid Dynamics for 4th year engineering students. Since 2000, he has supervised 14 PhD students to successful completion. He is the author of more than 550 publications, including 3 monographs, 9 book chapters and 243 papers in international refereed journals. His current ISI Web of Science (Google Scholar) citation index is 35 (46). He has been a Fellow of the Institute of Physics (UK) since 1994, was Chairman of the scientific committee of the 27th European Conference on Liquid Atomization and Spray Systems (University of Brighton, 2016), a Leadership in Research Excellence Awardee at the University of Brighton (2017), and has been a Member of the Scientific Council of the International Centre for Heat and Mass Transfer (ICHMT) since 2018. His previous research focused on the development of asymptotic models for wave propagation in a hot plasma, and modelling of the processes in thermodynamically non-equilibrium systems (gas lasers). His current research interests focus on the numerical and asymptotic modelling of fluid dynamics, heat/mass transfer, and combustion processes in fuel and water sprays.

# LIST OF PAPERS

The following papers were presented at the International Conference on Fluid Flow and Thermal Science (ICFFTS'20)

## Experimental Fluid Dynamics And Heat Transfer

**Title:** Theoretical and Experimental Investigations for the Virtual Mass of a Taylor Bubble

**ICFFTS 122**

**Authors:** Abdullah Abbas Kendoush , Warren E. Overton

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**Title:** Experiments On Supercritical Flow Instability In Two Vertical Parallel Channels

**ICFFTS 125**

**Authors:** Inderjit Singh, Vijay Chatoorgoon

[View Paper](#)

**Title:** The Impact of the Location of Temperature Sensors on the Accuracy of Transient-State Temperature Distribution Identification

**ICFFTS 124**

**Authors:** Mariusz Konieczny

[View Paper](#)

**Title:** Friction and Wear Behaviors of Porous Paper-Based Friction Pairs in Wet Clutches by Pin-on-Disc Tests

**ICFFTS 103**

**Authors:** Mariusz Konie

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# LIST OF PAPERS

## Energy Optimization

**Title:** Prediction Of Performance For An Ejector Refrigeration Cycle Working With R245fa Using Artificial Neural Network

**ICFFTS 120**

**Authors:** Mehdi Bencharif, Sergio Croquer, Sebastien Poncet, Said Zid, Hakim Nesreddine

[View Paper](#)

**Title:** Carbon dioxide – based energy storage system: a thermodynamic approach

**ICFFTS 126**

**Authors:** Jeanne Lamotte, Sébastien Poncet

[View Paper](#)

**Title:** Salt Impregnated Matrices For Water-vapour Adsorption-based Thermal Energy Storage

**ICFFTS 127**

**Authors:** Curtis Strong, Suboohi Shervani, Ye Carrier, F. Handan Tezel

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**Title:** Simulation of Water Vapor Adsorption in a Fixed-bed Column with Silica Gel Material for Thermal Energy Storage Applications

**ICFFTS 128**

**Authors:** Ye Carrier , Curtis Strong and F. Handan Tezel

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# LIST OF PAPERS

## Heat And Mass Transfer

**Title:** 2D Frost Formation Model in Counterflow Heat Exchanger

**ICFFTS 121**

**Authors:** Alexandre Coulombe, Hachimi Fellouah, Sebastien Poncet

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**Title:** Two Approaches to Mathematical Modelling of Heating/Evaporation of a Multi-component Liquid Film

**ICFFTS 130**

**Authors:** Ming Jia, Yanzhi Zhang, Oyuna Rybdylova, Sergei S. Sazhin

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**Title:** Mini Review On The Effects Of Concentration Polarization In Forward Osmosis And Pressure-retarded Osmosis Processes

**ICFFTS 129**

**Authors:** Daryoush Emadzadeh, Boguslaw Kruczek

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# SPONSORS

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# ETHICS & MALPRACTICE

## Publication Ethics and Publication Malpractice Statement

The following statement is mainly based on the Code of Conduct and Best-Practice Guidelines for Journal Editors (Committee on Publication Ethics, 2011).

### Scientific Committee

#### ***Scientific Committee***

Scientific committees consisting of experts in the fields are established. The committees oversee the peer-review and publication process. To see the scientific committee members, please follow the link below.

#### **Scientific Committee**

#### ***Equality and Decisions***

One or more reviewer, scientific committee member, or chair, (internal or external), are responsible for evaluating the relevance of the submitted manuscripts to the proceedings, technical and scientific merit, originality, and impact. These evaluations are to be carried out regardless of ethnicity, religion, gender, sexual orientation, political beliefs, and institutions. Successive to peer-review, the Chair has full authority and is solely responsible for the published content and the process thereof.

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Scientific committee member(s) and publishing staff may not disclose manuscripts or their content, directly or indirectly, to anyone other than individuals invited to review the manuscript (whether they accept or not), other reviewers of the same publications, and publishing staff.

#### ***Conflicts of Interest***

Scientific committee member(s) and publishing staff may not utilize the contents of submitted manuscripts whether accepted or rejected, directly or indirectly for their own research purposes without prior written consent by the authors.



# ETHICS & MALPRACTICE

## Reviewers

### ***Contribution to Decisions***

In order for final decisions to be made regarding acceptance or rejection of papers, we rely on peer-review. Peer-review is the process of experts in the field reading, understanding, and objectively commenting on submitted papers. Through peer-review, scholars give back to the academic and scientific community by helping the chair(s) make decisions regarding manuscripts.

### ***Promptness***

Reviewers should promptly notify the chair(s) if they are unable or unqualified to carry out their reviewing duties. Reviewers should do their best to provide the reviews to the chair(s) as promptly as possible, and within the designated time-frame.

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### ***Thoroughness***

Reviewers should thoroughly read, understand, and provide constructive feedback with the aim of improving the manuscript. Reviewers should aim to identify and report technical issues, irregularities, mistakes, missing citations, and similarity to other published work.

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# ETHICS & MALPRACTICE

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### ***Authorship***

Only persons who have significantly contributed to the work and the manuscript can be named authors on a paper. These contributions include the idea/concept, design, experiments, evaluation, analysis, drafting or revision of the manuscript, and others. Authors must all have agreed to be named as such and for the manuscript to be submitted. Anyone who has contributed based on the above, but the level of contribution is not significant, may appear in the acknowledgement section of the manuscript.

### ***Accuracy, Originality, and Plagiarism***

Authors should describe their work and the results of their work accurately and in full. The level of provided accuracy and detail should be such that a reader can replicate the work independently. Inaccurate, incomplete, fraudulent, and misleading statements are considered unacceptable and unethical. Direct or indirect use of other people's work is not allowed, unless properly cited. Previous works that have influenced the current work should also be cited. Presenting someone else's work as one's own is strictly prohibited and is considered plagiarism.

### ***Data and Material***

Authors are encouraged to share their data, software, or other sharable material online, provided copyright and ownership laws surrounding that particular project permit. Authors may also be asked to share such material with the chair(s), and/or reviewers, and must be willing to do so if asked.

### ***Dual Submissions***

Submitting a manuscript to more than one venue (conference, journal, etc) simultaneously is not allowed. Presenting previously published work to be considered as a new submission, without a significant new interpretation or analysis, is prohibited.

# ETHICS & MALPRACTICE

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Authors must notify the chair(s) at the time of submission, if any factor outside the scope of the research has influenced any step of the work and manuscript writing. Examples of such factors include but are not limited to funding, grants, advisory and consultancy, stock ownership, current or past employment, and memberships, among others. All funding sources should be disclosed in the manuscript.

## ***Animal and Human Subjects***

Works involving human and/or animal subjects must ensure that the work has abided by institutional guidelines, and pre-approved by required bodies. Moreover, consent must be acquired from participants, and privacy of subjects must be ensured. All of the above must be specified with clear statements in the manuscript.

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Unethical/plagiarism issues mostly result in a retraction, while unintended mistakes will mostly result in the publication of an erratum.

# ETHICS & MALPRACTICE

## **Publisher**

### ***Errata and Retractions***

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### ***Ownership and Management***

This conference-proceedings is managed and operated by the International ASET (International Academy of Science, Engineering, and Technology) and Avestia Publishing (the publishing arm of ASET).

### ***Schedule***

This conference proceeding accompanies the conference, meaning a new proceedings will be published every year for the corresponding annual conference of this series.

# CONTACT US

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