



**ICFFTS**  
2021

**2<sup>ND</sup> INTERNATIONAL CONFERENCE ON  
FLUID FLOW AND THERMAL SCIENCE  
(ICFFTS'21)**

**November 24- 26, 2021 | ~~Seoul, South Korea~~ 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 2<sup>nd</sup> International Conference on Fluid Flow and Thermal Science (ICFFTS'21).**

The goal of ICFFTS'21 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 second meeting of this conference, four 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 14 papers will be presented from professors, students, and researchers across the world.

We thank you for your participation and contribution to the 2<sup>nd</sup> International Conference on Fluid Flow and Thermal Science (ICFFTS'21). We wish you a very successful and enjoyable experience.

**Dr. Boguslaw Kruczek**  
**University of Ottawa, Canada**  
*Conference Chair*  
*ICFFTS'21*

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# ABOUT ICFFTS'21

**The 2<sup>nd</sup> International Conference on Fluid Flow and Thermal Science (ICFFTS'21) aims to become the leading virtual conference in fields related to fluid flow and heat transfer.** The goal of ICFFTS'21 is to gather scholars from all over the world to present advances in the relevant fields and to foster an 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.

ICFFTS'21 is an international conference will be held yearly. This conference focus on all aspects Fluid Flow and Thermal Science. ICFFTS'21 Will be held this year in Vrtual conference

**ICFFTS'21** 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)

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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'21 Conference:



**Dr. Boguslaw Kruczek**

University of Ottawa, Canada  
Conference Chair



**Dr. Jiheong Kang**

KAIST, South Korea  
local Committee Member

## Scientific Committee Members

- **Dr. Chamil Abeykoon**, The University of Manchester, UK
- **Dr. Jalel Azaiez**, University of Calgary, Canada
- **Dr. Yan Chen**, Purdue University, USA
- **Dr. Alessandro Gomez**, Yale University, USA
- **Dr. Mohammad Hojjat**, University of Isfahan, Iran
- **Dr. Wei-Xi Huang**, Tsinghua University, China
- **Dr. Gibum Kwon**, University of Kansas, USA
- **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
- **Dr. Chang Shu**, National University of Singapore, Singapore
- **Dr. Lian-Ping Wang**, Southern University of Science and Technology (SUSTech), China

# KEYNOTE SPEAKERS

The keynote information for the 2nd International Conference on Fluid Flow and Thermal Science (ICFFTS'21) is as follows:



**Dr. Gibum Kwon**  
**University of Kansas, USA**



**Dr. Gerardo Maria Mauro**  
**Università degli Studi del Sannio, Italy**

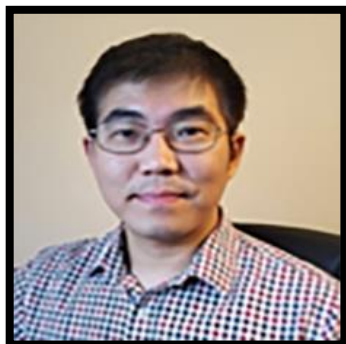


**Dr. Chang Shu**  
**National University of Singapore, Singapore**



**Dr. Lian-Ping Wang**  
**Southern University of Science and Technology,  
China**

## KEYNOTE LECTURE



**Title:** Manipulating Solid-Liquid Interfacial Interactions for Designing Surfaces with Special Wettability for Separation Processes

Dr. Gibum Kwon, University of Kansas, USA

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Gibum Kwon is an assistant professor of Department of Mechanical Engineering at the University of Kansas. He received his Ph.D. in Materials Science and Engineering from the University of Michigan – Ann Arbor in 2014, where he developed separation methodologies for liquid-liquid mixtures with a research advisor Professor Anish Tuteja. During his Ph.D., he was awarded Materials Research Society (MRS) Graduate Student Silver Award and Rackham Predoctoral Fellowship (2013). From 2014 to 2016, he worked as a Postdoctoral Associate at MIT. At MIT, he conducted research on the wettability switching of photo-responsive semiconducting materials upon light illumination with Professors Gareth H. McKinley and Kripa K. Varanasi. In 2016, he joined the Department of Mechanical Engineering at the University of Kansas as an assistant professor. He is a recipient of NSF CAREER award (2020), Wesley G. Cramer Award (2020), and Hanwha Young Faculty award (2021). He has co-authored 20 refereed journal articles, as well as 8 patents of which 2 have been licensed.

# KEYNOTE LECTURE



**Title:** Frontiers in Numerical Optimization of Heat Sinks

Dr. Gerardo Maria Mauro, Università degli Studi del Sannio, Italy

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Gerardo Maria Mauro was born in Benevento on May 12, 1988. He is Assistant Professor at “Università degli Studi del Sannio”, Department of Engineering, since December 2018. His main research topics concern: i) numerical simulation and optimization of building energy design or retrofit; ii) large-scale analysis of building stocks via machine/deep learning; iii) development and optimization of strategies for the model predictive control of energy systems; iv) investigation of innovative building components for 3d printing; iv) advanced modeling and optimization of heat transfer systems via numerical methods and machine/deep learning. He is author of more than 50 scientific publications at international level. Five of them have been “highly cited papers” according to ISI Web of Science. According to SCOPUS database (November 2021) he has H-Index equal to 19 and 1296 citations. He is Editorial Board Member of the MDPI Journals “Sustainability”, “Energies” and “Buildings”. He is Reviewer of more than 20 international Journals published by Elsevier, Taylor & Francis, MDPI and Springer. He participates to different national and European research projects.



# KEYNOTE LECTURE



**Title:** Lattice Boltzmann and Gas Kinetic Flux Solvers and Their Applications  
Dr. Chang Shu, National University of Singapore, Singapore

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Dr Chang Shu is a Professor at the Department of Mechanical Engineering, National University of Singapore. He got his BEng and MEng respectively in 1983 and 1986 from Nanjing University of Aeronautics and Astronautics, China, and his PhD in 1991 from the University of Glasgow, UK. Dr Shu has been working in the computational Fluid Dynamics (CFD) for more than 35 years. His major interest is to develop efficient numerical methods to solve heat transfer and fluid flow problems, which are governed by a set of partial differential equations. Recently, he developed a series of flux solvers, which are based on the lattice Boltzmann equation and Boltzmann equation. These solvers can be well applied to simulate fluid flows from incompressible regime to hypersonic regime on structured and unstructured meshes. He also made effort to develop some efficient models for simulation of multiphase flows and flows around moving boundaries. So far, he has authored 4 monographs and published more than 350 articles in the international referred journals (SCI indexed). His work has been cited more than 20000 times in Google Scholar.

# KEYNOTE LECTURE



**Title:** Development and Application of Mesoscopic CFD Methods for Compressible and Thermal Flows

Dr. Lian-Ping Wang, Southern University of Science and Technology, China

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Dr. Lian-Ping Wang received a Bachelor's degree in Mechanics from Zhejiang University, Hangzhou, China in 1984, and a PhD in Mechanical Engineering from Washington State University, USA in 1990. He was then a Visiting Research Associate at Brown University from 1990 to 1992, after which he was a Research Associate at Pennsylvania State University from 1992 to 1994 and an Assistant Professor of Mechanical Engineering at the University of Delaware from 1994 to 2001. He became an Associate Professor in 2001 and a Professor in 2010 at the University of Delaware. In 2017, he was appointed a Chaired Professor at Southern University of Science and Technology, China. Dr. Wang's areas of expertise include turbulent multiphase flows, computational fluid dynamics (CFD) in particular mesoscopic CFD methods, and modeling of complex flows. He has published around 142 refereed journal papers and has given over 100 invited talks. Dr. Wang became an elected Fellow of American Physical Society in 2011 and an elected Fellow of American Society of Mechanical Engineers in 2016, and an Invitation Fellow of Japan Society for the Promotion of Science (9/2016 – 3/2017).

# LIST OF PAPERS

The following papers were presented at the 2<sup>nd</sup> International Conference on Fluid Flow and Thermal Science (ICFFTS'21)

## CFD

**Title:** An Immersed Boundary Projection Method for Complex Fluid-Structure-Interaction Simulation

Invited Speaker

**Authors:** Weixi Huang, Luo-Hao Wang

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**Title:** Numerical Solution for Inertial Corner Flows in a Fluid Superposed Porous Layer

**Authors:** Abhijit Verma

[View Paper](#)

**Title:** Analysis of Vorticity Distribution in a Closed Partially Porous Domain

**Authors:** Abhijit Verma

[View Paper](#)

**Title:** Convective Heat Transfer inside a Rotating Cylinder Experiencing an Axial Air Flow

**Authors:** Desmond Adair, Bakhtiyar Kalzhan

[View Paper](#)

# LIST OF PAPERS

The following papers were presented at the 2<sup>nd</sup> International Conference on Fluid Flow and Thermal Science (ICFFTS'21)

## CFD

**Title:** Heating and Evaporation of Droplets on a Super-hydrophobic Surface: Preliminary Results

**Authors:** Dmitrii Antonov, Roman Fedorenko, Pavel Strizhak, Sergei S. Sazhin

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**Title:** Evaluation Of Mass Transfer And Interfacial Area Correlations In Direct Contact Packed-Bed: Comparison Of Correlations

**Authors:** Mahyar Abedi, Parnab Saha, Xu Tan, James F. Klausner, Andre

[View Paper](#)

**Title:** Finite-time Lyapunov Exponent analysis used on a free-surface flow problem solved by Smoothed Particle Hydrodynamics

**Authors:** Petr Jančík, Tomáš Hyhlík

[View Paper](#)

**Title:** Investigating the impact of Longitudinal and Lateral Distances on the Lift and Drag Coefficients of two Closely Moving Vehicles

**Authors:** Mohammadreza Saber Ashkezari, Ali Mohammad, Masoud Darbandi, Gerry E. Schneider

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# LIST OF PAPERS

## CFD

**Title:** Dependency of Purge Duration of an Atomic Layer Deposition Process on the Outlet Size of a Viscous Flow Reactor

**Authors:** Betelhiem N. Mengesha, Mohammad Reza Shaeri

[View Paper](#)

**Title:** Design and CFD Simulation of Interior Wind Guides for the Four Dry Cooling Towers of Shazand Power Plant to Improve the Performance of Cooling System in Critical Peak Hours

**Authors:** Masoud Darbandi, Kazem Mashayekh, Pooya Javadpour-Langroodi, Fakhreh Seyedi, Gerry E. Schneider, Shahram Iranpak, Javad Farhadi

[View Paper](#)

**Title:** Numerical Study of Supercritical R134a Heat Transfer in A Horizontal Internally Ribbed Tube

**Authors:** Dabiao Wang, Hang Lu, Enjie Fang, Lanlan Li

[View Paper](#)

**Title:** Modulation of a R245fa Supersonic Ejector By A Movable Needle: A Numerical Study

**Authors:** Charles P. Rand, Sergio Croquer, Michel Poirier, Sébastien Poncet

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# LIST OF PAPERS

## Newtonian & Non-Newtonian Flow and Heat Transfer

**Title:** Stability Of Vertical Double-Diffusive Interfaces In The Presence Of Material Diffusion

**Authors:** Khaled Al Mashrafi

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**Title:** Prediction Of Head Degradation Of A Centrifugal Pump Handling Power-Law Fluid

**Authors:** Péter Csizmadia, Dávid Lajos Lukácsi, Sára Till

[View Paper](#)

**Title:** The Fluid Dynamics of Rising and Evaporating Droplet in an Immiscible Liquid

**Authors:** Abdullah Abbas Kendoush

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# SPONSORS

International ASET Inc. would like to thank the following sponsors for their support of ICFFTS'21:



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# ICFFTS'22

The 3rd International Conference on Fluid Flow and Thermal Science (ICFFTS'22) will be held on October 27, 2022 - October 29, 2022 in Seoul, South Korea.



For inquiries and to obtain further information on the congress, please visit the [website](https://2022.icffts.com)

You can also email [info@icffts.com](mailto:info@icffts.com) or call us at:

+1-613-834-9999

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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**

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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, originally, 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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# ETHICS & MALPRACTICE

## Reviewers

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### ***Thoroughness***

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# ETHICS & MALPRACTICE

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### ***Authorship***

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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.

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# ETHICS & MALPRACTICE

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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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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.

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For inquiries and to obtain further information on the congress, please visit the **website**

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