

# PROCEEDINGS OF THE 9<sup>TH</sup> WORLD CONGRESS ON MOMENTUM, HEAT AND MASS TRANSFER (MHMT 2024)

April 11 - 13, 2024 | Imperial College London Conference Center, London, United Kingdom

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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 9<sup>th</sup> World Congress on Momentum, Heat and Mass Transfer (MHMT 2024).

MHMT is aimed to become one of the leading international annual congresses in the fields of momentum, heat and mass transfer. This congress will provide excellent opportunities to scientists, researchers, industrial experts, and university students to present their research achievements and to develop new collaborations and partnerships with experts in the field.

In the ninth meeting of this Congress, two plenary and four keynote speakers will share their expertise in a wide spectrum of fields and applications. In addition, approximately 113 papers will be presented by professors, students, and researchers from across the world.

We thank you for your participation and contribution to the 9<sup>th</sup> World Congress on Momentum, Heat and Mass Transfer (MHMT 2024). We wish you a very successful and enjoyable experience.

#### **Dr. Lixin Cheng**

Congress Chair and Proceedings Editor MHMT 2024

#### Dr. Tassos G. Karayiannis

Congress Co-Chair and Proceedings Editor MHMT 2024

#### Dr. Sohel Murshed

Congress Local Chair MHMT 2024

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### **ABOUT MHMT 2024**

MHMT is aimed to become one of the leading international annual congresses in the fields of momentum, heat and mass transfer. This congress will provide excellent opportunities to the scientists, researchers, industrial engineers, and university students to present their research achievements and to develop new collaborations and partnerships with experts in the field.

There are 3 conferences included in the CSEE Congress:

<u>ENFHT'24</u> - 9th International Conference on Experimental and Numerical Flow and Heat Transfer

<u>ICMFHT'24</u> - 9th International Conference on Multiphase Flow and Heat Transfer <u>CSP'24</u> - 9th International Conference on Combustion Science and Process

While each conference consists of an individual and separate theme, the 3 conferences share considerable overlap, which prompted the organization of this congress. The goal of this undertaking is to bring together experts in each of the specialized fields, and at the same time allow for cross pollinations and sharing of ideas from the other closely related research areas.

MHMT is an acronym for Momentum, Heat, and Mass Transfer

- The proceedings is published in Ottawa, Canada.
- All papers were peer-reviewed
- The congress proceedings is published under an ISSN and ISBN number
- Each paper is assigned a unique DOI number by <u>Crossref</u>
- The conference proceedings is indexed by Google Scholar
- The proceedings is permanently archived in <u>Portico</u> (one of the largest community-supported digital archives in the world)





### **SCIENTIFIC COMMITTEE**

We would like to thank the following for accepting to act as a member of the Scientific Committee for the MHMT 2024 Congress:

#### Scientific Committee Members for ENFHT 2024

- Dr. Rayhaneh Akhavan, University of Michigan, USA
- Dr. Jalel Azaiez, University of Calgary, Canada
- Dr. Longfei Chen, Beihang University, China
- Dr. Yanping Du, Shanghai Jiao Tong University, China
- Dr. Zhixiong Guo, Rutgers University, USA
- Dr. Gamze Gediz Ilis, Gebze Technical University, Turkey
- Dr. Konstantinos Kontis, University of Glasgow, UK
- Dr. Sébastien Poncet, Sherbrooke University, Canada
- Dr. Ziad Saghir, Ryerson University, Canada

#### Scientific Committee Members for CSP 2024

- Dr. Pedro Jorge Martins Coelho, University of Lisbon, Portugal
- Dr. Young Choi, Korea Institute of Machinery and Materials, Korea
- Dr. Byungchul Choi, Chonnam National University, Korea
- Dr. Javad A. Esfahani, Mashhad Ferdowsi University, Iran
- Dr. Amir H. Mohammadi, University of KwaZulu-Natal, South Africa
- Dr. Dimitrios C. Rakopoulos, Center for Research and Technology Hellas, Greece
- Dr. Constantine D. Rakopoulos, National Technical University of Athens, Greece
- Dr. Guido Saccone, CIRA Italian Aerospace Research Centre, Italy
- Dr. Tassos Stamatelos, University of Thessaly, Greece

### **SCIENTIFIC COMMITTEE**

#### Scientific Committee Members for ICMFHT 2024

- Dr. Sadegh Dabiri, Purdue University, USA
- Dr. Gioia Falcone, University of Glassgow, UK
- Dr. Kamiel Gabriel, University of Ontario Institute of Technology, Canada
- Dr. Afshin J. Ghajar, Oklahoma State University, USA
- Dr. Liejin Guo, Xi'an Jiaotong University, China
- Dr. Faik Hamad, Teesside University, UK
- Dr. Marcello Iasiello, Università degli Studi di Napoli Federico II, Italy
- Dr. Ali Kosar, Sabanci University, Turkey
- Dr. Ali Ozel, Heriot-Watt University, UK
- Dr. Huihe Qiu, Hong Kong University of Science & Technology, Hong Kong
- Dr. Qinlong Ren, Xi'an Jiaotong University, China
- Dr. Sergei Sazhin, University of Brighton, UK
- Dr. Mostafa Safdari Shadloo, National Institute of Applied Science (INSA),
   France
- Dr. Günter H. Schnerr, Technical University of Munich, Germany
- Dr. Pengfei Wang, Xi'an Jiaotong University, China
- Dr. Berend van Wachem, University of Magdeburg, Germany
- Dr. Somchai Wongwises, King Mongkut's University of Technology Thonburi,
   Thailand
- Dr. Jiyun Zhao, City University of Hong Kong, Hong Kong

### PLENARY/KEYNOTE SPEAKERS

The Plenary and keynote speakers information for the 9th World Congress on Recent Advances in Nanotechnology (MHMT 2024) is as follows:

#### **Plenary Speakers**



Dr. Li He
University of Oxford, UK
ENFHT'24 Plenary Speaker



Dr. Josua P Meyer
Stellenbosch University, South
Africa
ENFHT'24 Plenary Speaker

#### **Keynote Speakers**



Dr. Lars Davidson
Chalmers University of
Technology, Sweden
ENFHT'24 Plenary
Speaker



**Dr. Jun Peng**University of Lincoln, UK
CSP '24 Keynote Speaker



Dr. Koulis Pericleous
University of Greenwich,
UK
ENFHT'24 Keynote
Speaker



Dr. Gavin Tabor
University of Exeter, UK
ENFHT'24 Keynote Speaker

### **ENFHT 2024 PLENARY SPEAKER**



**Topic of Plenary:** Leveraging Scale-interaction: Two-scale Approach to Turbulent Flow and Heat Transfer over Smooth and Micro-structured Wall Dr. Li He, University of Oxford, UK

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Li He earned BSc & MSc at Beihang University (1982, 1984), and PhD at Cambridge University (1990). He remained at Cambridge as a postdoc and a college research fellow until 1993, then moved to Durham University, as Lecturer (1993), Reader (1998) and Professor (2000). At Durham, he became the Head of Thermofluids and the Director of Research for the School of Engineering, before being elected to the Royal Academy Engineering/Rolls-Royce Research Chair at Oxford (2008-2013).

He holds the Statutory Chair Professorship of Computational Aerothermal Engineering at University of Oxford, and is the Oxford co-director of the EPSRC Centre of Doctoral Training (CDT) in Gas Turbine Aerodynamics. He had been the head of the Osney Laboratory (2008-2011), and the acting director of the Rolls-Royce University Technology Centre (UTC) in heat transfer and aerodynamics. Under his leadership his leadership, the Osney Lab had undertaken a major (18 months) upgrading relocation, acquired the 2nd generation flagship Oxford Turbine Research Facility (OTRF), and doubled the number of academics. The new Osney Lab has been the reinvigorated centre of turbomachinery research at Oxford (renamed as 'Oxford Thermofluids Institute' since 2018).

#### **ENFHT 2024 PLENARY SPEAKER**



**Topic of Plenary:** Fundamental Differences between Developing Internal Forced Convection Flow for a Uniform Heat Flux and a Uniform Wall Temperature on the Wall of a Circular Tube **Dr. Josua P Meyer,** Stellenbosch University, South Africa

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Professor Josua Meyer was appointed as a professor at Stellenbosch University in April 2022. Prior to this position, he held the title of professor at the University of Pretoria. During his tenure as a professor, he served as the Head of Mechanical and Aeronautical Engineering, overseeing a student body of 1,900, for 20 years. Additionally, he held the position of Chair of the School of Engineering, with a student population of 7,000, for 17 years. Notably, this institution is renowned as one of the largest engineering schools Professor Meyer's research encompasses a wide range of thermal sciences, with a specific focus on heat exchangers. His work in this area centres around essential investigations in internal forced convection, the transitional flow regime, nanofluids, boiling, and condensation. On an applied level, his research delves into thermal-solar, wind, and nuclear energy. He has cultivated a research group comprising approximately 30 full-time graduate students and 10 staff members. Over the years, he has also established several state-of-the-art laboratories, designed and constructed more than 14 unique experimental setups in collaboration with his The recognition of Professor Meyer's contributions extends beyond his academic appointments. He has been honoured with 11 national teaching awards from three different universities, in addition to an international award. His instructional videos on heat transfer, available on YouTube, have garnered over 1.8 million views. Furthermore, his exceptional research endeavours have earned him over 45 prestigious accolades, including 24 awards for the best article of the year or best conference paper. Notably, 12 of his postgraduate students have received international and national awards for the calibre of their work under his guidance.

### **ENFHT'24 KEYNOTE SPEAKER**



**Topic of Keynote:** Improving Turbulence Models and Wall Functions by Using Machine Learning **Dr. Lars Davidson,** Chalmers University of Technology, Sweden

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Dr. Lars Davidsion is a professor at Chalmers University of Technology, Department of Mechanics and Maritime Sciences and he has been head of the division of Fluid Dynamics since 2005. The general subject of his research is the computation of fluid flow and heat convective transfer using finite volume computations. He is working with in-house finite volume codes (CALC-BVC, CALC-LES), which have been developed within the group. Turbulence modelling for fluid flow and heat transfer is the focus of his research. Currently, a larger part of the research is concentrated on Large Eddy Simulations (LES). Lately, Dr. Lars has been focused on hybrid LES/RANS, an approach to make it possible to use LES for wall-bounded flows at high Reynolds numbers. Since 2022, he has had to work on Machine Learning to improve wall functions and turbulence models.

### CSP 2024 KEYNOTE SPEAKER



**Topic of Keynote:** Flows and Combustions of Hydrogen and Ammonia **Dr. Jun Peng,** University of Lincoln, UK

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Jun Peng is a Professor of Sustainable Energy Engineering in the University of Lincoln. He received his PhD degree from National Engine Combustion Lab (current State Key Lab of Engines), Tianjin University, China in 1996, for a research on the investigation of high pressure fuel injection and spray characteristics. After four years working experiences as research fellow in Brunel University and two years as senior development engineer in Ford Motor Company, he held the position of Lecturer since 2004 and Senior Lecture since 2007 in the University of Sussex. Prior to his current appointment, he worked as Professor in Engineering in University of Bedfordshire. Jun Peng's research interest thermodynamics, fluid dynamics and combustion with applications on flows and combustion in IC engines, gas turbines, fuel cells and other sustainable energy systems. His recent research works have contributed to sustainable vehicle powertrain, non-carbon water transport technology, combination of solar PV and solar thermal for energy efficiency improvement, etc. Jun Peng is a fellow of IMechE, chartered engineer recognised by IMechE and the member of Professional Review Committee of IMechE. He was an invited fellow of Japan Society for the Promotion of Science (JSPS), and the Associate Editor of IET journal of Electronics Letters (SCI indexed).

### **ENFHT 2024 KEYNOTE SPEAKER**



**Topic of Keynote:** Solidification of Alloys under the Influence of External Fields **Dr. Koulis Pericleous,** University of Greenwich, UK

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With a first degree in Aeronautics, Prof Koulis Pericleous completed a PhD in unsteady aerodynamics in 1978 at Queen Mary College, University of London. His first post-university employment was with Prof D B Spalding's scientific software company CHAM Ltd, where as part of the development team contributed among others to the development of PHOENICS, the first ever commercial Computational Fluid Dynamics (CFD).

He joined the University of Greenwich, UK in 1989 and over his 30+ year tenure as the professor of CFD, he has enthusiastically promoted CFD as a tool for industry and the environment through both research and teaching. In Greenwich he formed the Computational Science and Engineering research group and brought his knowledge of fluid dynamics into both practical and fundamental research. Recent focus has been the multi-physics world of metals processing, in particular aerospace alloys and light metals. This work encompassed many length scales from macroscale (such as continuous or shape casting, aluminium electrolysis cells and VAR processing), mesoscale (welding and Additive Manufacturing) to microstructure formation (freckle defects, or high undercooled growth). The complex nature of all these processes led Koulis to develop PHYSICA, a multiphysics code in continuous evolution since 1992. Koulis has received numerous awards including the TMS 2021 Light Metals Award for his work on "Contactless Ultrasonic Treatment in Direct Chill Casting", detailing a novel idea of generating fluid flow and ultrasonic cavitation in liquid metals from an external magnetic field. He has supervised over 40 PhD students, co-authored around 400 articles, led many national and international projects, and provided consultancy services to a number of organisations worldwide.

### CSP 2024 KEYNOTE SPEAKER



**Topic of Keynote:** Coupling Bayesian Optimisation with CFD for Multiphysics Optimisation **Dr. Gavin Tabor,** University of Exeter, UK

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Gavin Tabor is Professor of CFD at the University of Exeter and has spent much of his career developing and promoting CFD and the open source code OpenFOAM. Having started off studying Physics at university (BA Natural Sciences, University of Cambridge, 1990; DPhil Theoretical Astrophysics, University of Oxford, 1994), he then worked for 5 years as a postdoc in the research group led by Prof David Gosman at Imperial College, working on CFD for multiphase flow and premixed turbulent combustion. At this time he also began working with and contributing to the code FOAM (Field Operation And Manipulation), later to be released as OpenFOAM.

Appointed as a lecturer in Mechanical Engineering at the University of Exeter in 1999, he has developed an extensive research programme in CFD in areas as diverse as turbulence modelling, multiphysics, image based meshing, and optimisation. He has also worked on the application of CFD in areas such as biofluid mechanics, sustainable urban drainage and additive manufacture, and collaborated closely with major UK and international companies — current collaborations are with Hydro International (SUDs), Torin Sifan (turbomachinery) and Oxford Instruments (plasma simulation). In addition to the "traditional" area of physics-based simulation in CFD, Prof Tabor's recent work has also included Machine Learning/Data Science approaches to simulation, including Bayesian Optimisation and Physics-Informed Neural Networks (PINNs).

Prof Tabor continues to be active within the international OpenFOAM community, particularly as Chair of the Joint Technical Committees for OpenFOAM Governance, and on the Editorial Advisory Board for the new OpenFOAM Journal.

The following papers were presented at the 9th World Congress on Momentum, Heat and Mass Transfer (MHMT 2024).

#### **Virtual Session**

#### Ion Beam Induced Directional Flow of Ionic Liquid at Nanoscale

Authors: Haohao Gu, Kaixin Meng, Hao Wang1Haohao Gu, Kaixin Meng, Hao Wang

<u>Comparison Of The ORC And The PEORC For Low-Temperature Industrial Waste</u> <u>Heat Exploitation</u>

Authors: Anastasios Skiadopoulos, Dimitrios Manolakos

<u>Fabrication and Experimentation of a Thermally Efficient Multi-Stage</u>
<u>Thermoelectric Cooler for Lightweight Cooling Wearables</u>

Authors: Elisa Y.M. Ang, Peng Shu Ng, Chew Beng Soh and Peng Cheng Wang

<u>Computational Fluid Dynamics Analysis of Absorber Tube with Molten Saltbased Nanofluids and Porous Medium Inserts</u>

Authors: Zhaoping Ying, Junfeng Yang, Boshu He

**Grey Box Model of CO2 Refrigeration System for Heat Recovery Analysis** 

Authors: Emilio-José Sarabia-Escriva, Víctor Soto-Francés, José-Manuel Pinazo-Ojer, Salvador Acha

A Model of Dynamic Characteristics of Water-cooled Wall in (Ultra) Supercritical Once-through Boiler Based on Moving Boundary Method

Authors: Jiacheng Lou, Yeming Liu, Huixiong Li

<u>Molecular Dynamics Study of Boiling Heat Transfer on Hydrophilic Rectangular</u> Nano Groove Surfaces

Authors: Zhibin Li, Wen Chan, Xi Li, Hengyuan Wang, Huixiong Li

### **Virtual Session**

<u>Influence of Liquid Electrical Conductivity on the Electroosmotic Flow</u>
Characteristics inside the Wavy Microchannel under Joule Heating

Authors: Sumit Kumar Mehta, Pranab Kumar Mondal, Somchai Wongwises

<u>Development Of A Filtered Reaction Rate Model For Coarse-Grid Simulations Of</u> Reactive Gas-Solid Flows

Authors: Lingxue Wang, Zheqing Huang, Qiang Zhou

<u>Fire Behavior of bio-sourced composites under Varied Heat Flux Levels</u>

Authors: Raphael Ogabi, Brady Manescau, Khaled Chetehouna, Jeffrey Barminas, Abdulwasiu, Mohammed Raji, Bukola Abiodun, Jude Okoli

<u>Optimization Study of Power-Law Fluids Staggered Circular Cylinders in Laminar</u> Forced Convection

Authors: Kumar Kartikey Agarwal, Niharika Dutt, Preeti Suri, Swati A. Patel

<u>Investigation of Pressure Drop and Heat Transfer Characteristics in a Microchannel with Pin-Fins</u>

Authors: Alişan Gönül, Tassos G. Karayiannis

<u>Performance Evaluation of a Twin Fluid Air-Blast Atomizer for the FCC Feed</u>
<u>System: An Experimental Study</u>

Authors: Deepak Kumar, Abhijit Kushari, Pramod Kumar, and Hemant Mishra

**Prediction of Horizontal Pipe Slurry Flow with Hindered Settling** 

Authors: Md Mahidul Haque Prodhan, Michael Fairweather, Jeffrey Peakall,

**Timothy Hunter** 

#### **Virtual Session**

<u>Numerical Analysis of Electric Vehicle Battery Thermal Management using</u> **Nanofluid** 

Authors: Hafiz Muhammad Ammar, Ali Ammar Naqvi, Nouman Ahmad, Muhammad Z. U. Khan, Ramisha Sajjad

Multiphase VOF Modelling of Finite and Infinite Flashing Flow in MSF <u>Desalination</u>

Authors: Tarek H Nigim

<u>The Fluid Compressible Effect on Particle Dynamics in Turbulent Vertical Channel Flow</u>

Authors: Tingting Li, Zhiwen Cui, Qiang Zhou

<u>Detection of Combustion Instabilities Cased by Premixed Flames Using</u>
<u>Convolutional Autoencoder</u>

Authors: Koji Maeta, Takenao Ohkawa

<u>Early Stages of Flame Propagation in Tubes with Non-Slip Walls: Mechanism of Tulip Flame Formation</u>

Authors: Michael A. Liberman

**Energy and Exergy Assessment of Nanofluids in Solar Energy Harvesting** 

Authors: Roy J. Issa

<u>Thermal Equivalent Circuit Modelling and Experimental Validation of Pouch-type</u>
<u>Lithium-ion Cell</u>

Authors: Belfun ARSLAN, Özgün YÜCEL, Cem Hakan YILMAZ

Methodology for Modeling Spray Cooling Of a Cylindrical Tube Heated In the Film Boiling Regime

Authors: Nilojendu Banerjee, Cameron Tropea, Satyanarayanan Seshadri

### **CFD**

<u>The Impact of Left Atrial Morphology on Thrombosis Risk in Atrial Fibrillation:</u> revisiting Virchow's Triad

Authors: Yan Wang, Kun Luo, Jianren Fan

Numerical and Experimental Studies on a Novel Kind of Hydraulic Levitation Micropump for Liquid Cooling System

Authors: Guanying Xing, Song Xue, Xinfeng Zhang, Yiwen Fan, Xiaobing Luo

Flow Analysis of an Ultrathin Forward-Curved Multi-Blade Centrifugal Fan at High Revolutionary Speed

Authors: Weiwei Liao, Yijun Mao, Xiaobing Luo

<u>Thermal Analysis of the Effect of Non-Newtonian Fluid on the Optimally Spaced Elliptical Cylinder</u>

Authors: Sidhant Kumar, Preeti Suri, Niharika Dutt, Swati A. Patel

<u>Effects of Mixture Stratification and Preferential Diffusion on Spherically Flames</u>
<u>Using Direct Numerical Simulation</u>

Authors: Jiahao Ren, Haiou Wang, Kun Luo, Jianren Fan

<u>Improvement of Interfacial Area Prediction on Condensing Steam-water Flow Using Bubble Collapse Model</u>

Authors: HERRY Tanguy, RAVERDY Bruno, MIMOUNI Stéphane, VINCENT Stéphane

**Numerical Model of High-Intensity Focused Applied to Soft Tissues** 

Authors: Paolo Guida, William L. Roberts

### **CFD**

Numerical Analysis of Hydrogen Transport Behavior Driven by Cold-Heat Sources in Containment

Authors: Liu Xinyan, Gao Li, Hu Zongwen, Sun Zhongning, Bian Haozhi

<u>Adaptive Mesh Refinement for LES-DEM Study on Heat and Mass Transfer in a</u>
Particle-laden Transcritical Jet Flow

Authors: Haozhe Su, Hui Jin, Liejin Guo

Simulation of the Internal Flow Field of Jet Pumps Using the RANS Method

Authors: Akbar Ravan Ghalati, Manuel Orlando Sandoval Pinto, Sergio Croquer Perez, Sébastien Poncet, Jay Lacey, Hakim Nesreddine

**Passive Vibration Reduction in Circular Cylinders: The Role of Slits** 

Authors: Ussama Ali, Md Islam, Isam Janajreh

<u>Tailored Euler-Lagrange Model to Predict the Microfluidic Capture of Target Species</u>

Authors: Gloria González-Lavín, Belén García-Merino, Christian Fernández-Maza, Eugenio Bringas, Lucía Gómez-Coma, Marcos Fallanza, Inmaculada Ortiz

<u>Design and Analysis of Direction-Dependent Flow Resistance in Custom-Engineered Geometries at Low Flow Rates</u>

Authors: Mahdieh Mosayebi, Stephen J. Ferguson, Benedikt Helgason, Dominik Obrist

<u>The Multi-Node Moving Boundary Model for Transient Dynamics of A Typical</u>
Counter-Current Steam Generator Using Python Programming

Authors: A.Fakhraei, Farshad Faghihi

### **CFD**

<u>Thermal-Structural Co-Optimization of Passive Thermal Management System for Logging Tool</u>

Authors: Jiale Peng, Chao Deng, Wei Lan, Xiaobing Luo

<u>Strategic Cooling Enhancement through Trench-Shaped Injection Holes - Two-</u> <u>Phase Numerical Study</u>

Authors: Abhishek Verma, Debi Prasad Mishra

**Evaporation Dynamics and Vapor Accumulation of Paired Droplets on Heated Substrates** 

Authors: Won Yeong Hwang, Hyung Ju Lee, Chang Kyoung Choi, Hong Sun Ryou, Young Man Lee, and Seong Hyuk Lee

<u>Numerical Modelling Of Polymer Enhanced Oil Recovery: The Influence of the Degradation and Viscoelastic Properties</u>

Authors: Pablo Druetta and Francesco Picchioni

Studying the Ash Deposition Characteristics in an Aeroengine-based Optical Pyrometer Based on CFD modelling of Particle Impaction

Authors: Yongkai Quan, Jichen Liu, Jieming Chai, Qiuyang Yin, Jianyu Liu, Lina Zhang

#### <u>Particle – Resolved Simulation of Anisothermal Fluidized Beds</u>

Authors: Edouard Butaye, Rémy Quintana, Adrien Toutant, Samuel Mer, Françoise Bataille

<u>Hybrid Finite Differences - Lattice-Boltzmann Method for Multiphase Flows:</u>
Application to a Jet Simulation

Authors: Thomas Gregorczyk, Song Zhao, Pierre Boivin

#### **CFD**

<u>Thermal Loading Analysis of Hypersonic Flight Object with Re-Entry Trajectory</u> by Time-Adaptive Weakly Coupled Conjugate Heat Transfer

Authors: Yi-Hsun Chen, Tzong-Shyng Leu

Simulation of a Microchannel Heat Exchanger Considering Transverse Conduction

Authors: Akshay Virpaksha Khandare, G. Venkatarathnam

<u>Direct Numerical Simulation of Water Behavior in Sealing Gaps of High-Voltage</u> <u>Inverters Including Evaporation Effect</u>

Authors: Huijie Zhang, Anja Lippert, Tobias Tolle, Ronny Leonhardt, Luise Nagel, Tomislav Maric

<u>Direct Numerical Simulation of a Laboratory-Scale Jet in Cross-Flow with Pulverized Coal Combustion</u>

Authors: Lin Zheng, Haiou Wang, Jianren Fan, Kun Luo

**Carotid Artery Digital Twin Based On Reduced-Order Model** 

Authors: Yanlu Chen, Yuzhou Cheng,, Kun Luo, Jianren Fan

#### **Porous Media Heat Transfer**

<u>Data Analysis of Effective Thermal Conductivity Measurements of Sintered</u>
<u>Copper Powder of Various Pore and Particle Sizes</u>

Authors: Osama M. Ibrahim, Abdullah Almutairi, Ahmed H. Al-Saiafi

<u>Direct Numerical Modelling Of Capillary Driven Multiphase Flow at the</u> Embedded Steel - Porous Media Interface

Authors: Luka Malenica, Zhidong Zhang, Ueli Angst

<u>Temporary Well Plugging for Future CO2 Storage: CT Analysis of Thermal</u> Sensitive Polymer-Gel Dynamics in Low-Permeability Chalk

Authors: Hamed Movahedi, Adrian A. Schiefler, Nicolas Bovet, Henning-Friis

Poulsen

<u>Physics Informed Neural Network in Turbulent Porous Flow: Pore-scale Flow</u> Reconstruction

Authors: Seohee Jang, Mohammad Jadidi, Yasser Mahmoudi

#### **Combustion**

A Numerical Study for Atomization and Evaporation Processes of Liquid Fuel Jets in Crossflows Using Eulerian-Lagrangian Method

Authors: Mengzhen Cheng, Qian Meng, Haiou Wang, Kun Luo, Jianren Fan

<u>Determination of Kinetic Parameters of Rapid Pyrolysis of Ammonium</u> <u>Perchlorate</u>

Authors: Shani Saha, Prathamesh Phadke, Jay Patel, Rohit Sehrawat, Arvind Kumar, Arindrajit Chowdhury, Neeraj Kumbhakarna

Research on the Pressure Release Characteristics of Gas Explosion Shock Waves by Air Doors

Author: Xuebo ZHANG

<u>Comparison of Reacting DDES and LES CFD Simulation Methodologies for a Dual Inlet Ramjet Engine Combustor</u>

Authors: Mehmet Burak SOLMAZ, Sitki USLU

Retrofit and Experimental Evaluation of a Conventional Marine Diesel Engine for Dual Fuel Diesel-Methanol Operation

Authors: Vasileios Karystinos, George Papalambrou

<u>Sensitivity Analysis of Simulation Parameters on Premixed Propagating Flames:</u>
<u>Impact of XiFOAM Discretization Schemes</u>

Authors: Ayushi Mishra, Mayank Kumar, Krishnakant Agarwal

<u>Change Characteristics of Negative Drainage Pressure along the Drill Hole:</u>
Theoretical Analysis and Field Tests

Author: Jun Liu

**Large Eddy Simulation of a Swirling Spray Flame Using Spray Flamelet Model** 

Authors: Yicun Wang, Changxiao Shao, Tai Jin, Kun Luo, Jianren Fan

### **Experimental Measurements**

#### **Dynamics of Reactive Particles in Supercritical Water Turbulence**

Authors: Bofeng Bai, Kunpeng Zhao, Shuaiqi Zhao, Rui Zhang, Han Huan

#### **Biphilic Functional Surfaces for Icing and Anti-icing Applications**

Authors: Shaghayegh Saeidiharzand, Cenk Yanık, Abdolali Khalili Sadaghiani, Daniel Orejon, Khellil Sefiane, Ali Koşar

### <u>Disturbance in the Air-Temperature Field Due to Persistent Bubble Bursting on</u> the Water Surface

Authors: Shota Saito, Ayumi Saruwatari, Yasunori Watanabe

### <u>3D Magnetic Resonance Velocimetry Measurements of Turbulent Gas-Liquid</u> Flow

Authors: David Frank, Martin Bruschewski, Sven Grundmann

### **Experimental Measurements**

**Experimental Investigations on Measuring Falling Film Thickness on Vertical Plates with and without Copper Metal Foam** 

Authors: Naresh Chandora, Mani Annamalai, Advaith S

<u>Experimental Analysis of Soil Recovery and Heat Interactions with Ground in Slinky Connected Split Air-Conditioning System</u>

Authors: Satish Kumar, Murugesan Krishnan

<u>Experimental Research on Heat Conduction and Temperature Control Method in</u> the Chamber of Large-Scale Geotechnical Centrifuge

Authors: Chuanxiang Zheng, Jinjie Lu, Shuang Wei, Wei Huang, Jiaming Yan, Yuchen Dai, Zhenyu Wang, Zhaobo Song, Jiangun Jiang

Elucidating the Influence of Bubble Surface Area on Mass Transfer Kinetics in Gas/Liquid Systems

Authors: Anirban Ghosh, Michael Miranda, Clint P. Aichele

<u>Determination of Temperature Distribution and Convective Heat Transfer</u> <u>Coefficient in a Scraped Surface Heat Exchanger for Non-Newtonian Fluids</u>

Authors: Amanda Valle-Gómez, Darío Iker Téllez-Medina, Guillermo Ismael Osorio-Revilla, Alicia Ortiz-Moreno

Study of Growth and Dissolution of Oxygen Bubbles on Hydrophilic and Hydrophobic Substrates by Optical Methods

Authors: Hongfei Dai, Xuegeng Yang, Karin Schwarzenberger, Julian Heinrich and Kerstin Eckert

### **Experimental Measurements**

Optimization Method Of Working Wavelength Couple For High-Precision Fluorescence Temperature Measurement

Authors: Yongkai Quan, Qiuyang Yin, Jichen Liu, Jieming Chai, Jianyu Liu, Lina Zhang

**Experimental Characterization Of Heat And Mass Transfer In Cryogenic Storage Tanks** 

Pedro Afonso Marques, Alessia Simonini, Mathieu Delsipée, Miguel Alfonso Mendez

<u>Hydrogen Combustion for an Industrial Gas Turbine Burner: OH\*</u>

<u>Chemiluminescence Preliminary Measurements</u>

Authors: Christian Romano, Emanuela Gallo, Lorenzo Miris, Giulia Babazzi

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