PROGRAM

18th INTERNATIONAL HEAT TRANSFER CONFERENCE

Rio de Janeiro

August 02 – 07, 2026

ihtc18.org

PROMOTED BY:

ASSEMBLY FOR INTERNATIONAL HEAT TRANSFER CONFERENCES

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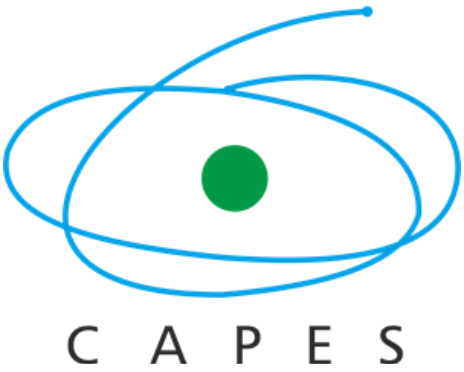

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CONFERENCE VENUE

The 18th International Heat Transfer Conference will be fully held in the Conference Center of the Windsor Hotel Complex in Barra da Tijuca, Rio de Janeiro.

Except for the Conference Banquet, all activities will take place in the conference rooms on the ground floor and second floor of Hotel Windsor Barra.

The Conference Banquet will be held in the ASIA conference room of Hotel Windsor Oceânico, which can be directly accessed from Hotel Windsor Barra.

A badge will be required for admission to all conference activities, including the IHTC-18 Welcome Cocktail and the Conference Banquet. Admission of accompanying persons is limited to the IHTC-18 Welcome Cocktail and Conference Banquet.

Windsor Hotel Complex
Avenida Lúcio Costa, 2630
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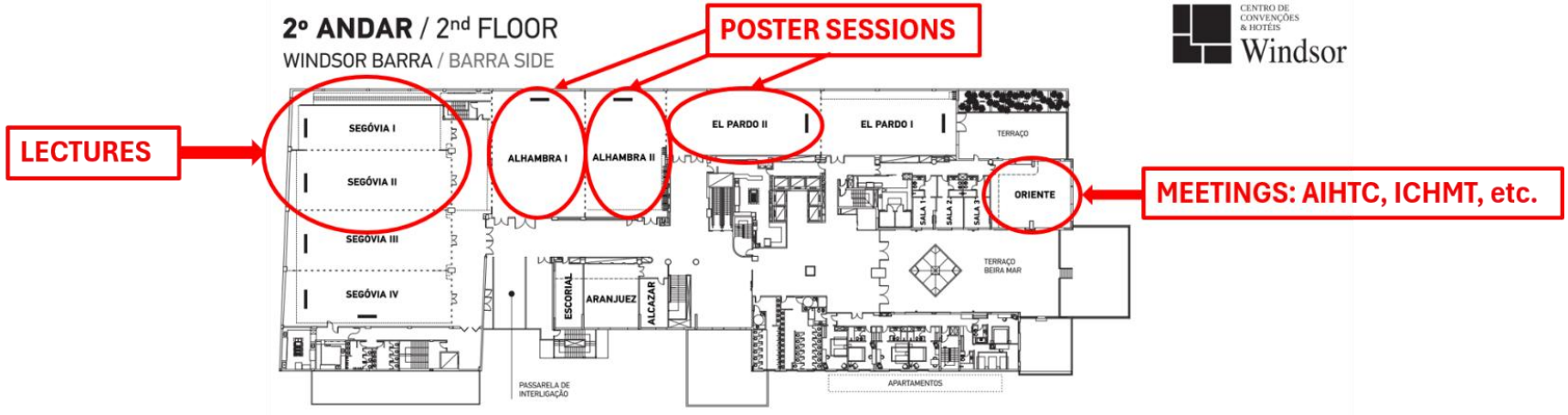

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SOCIAL EVENTS

Welcome Cocktail: Sunday, August 02, 19:00 - 21:00, Room VERSAILLES.

Conference Banquet: Thursday, August 06, 19:00 - 23:00, Room ASIA in the Conference Center of Hotel Windsor Oceânico.

SOCIETY MEETINGS

EUROTHERM Committee: Monday, August 03, 15:30 - 17:30, Room ORIENTE

Asian Union of Thermal Science and Engineering – AUTSE:

Monday, August 03, 16:00 - 18:00, Room LOUVRE

International Centre for Heat and Mass Transfer – ICHMT:

Scientific Committee & General Assembly:

Tuesday, August 04, 15:30 - 17:00, Room ORIENTE

Executive Committee: Tuesday, August 04, 17:00 - 18:30, Room ORIENTE

Assembly for International Heat Transfer Conferences – AIHTC:

Wednesday, August 05, 13:30 - 17:30, Room ORIENTE

PROGRAM AT A GLANCE

		Sunday - August 02
Room		Versailles I+II
13:00	13:30	Registration
13:30	14:00	
14:00	14:30	
14:30	15:00	
15:00	15:30	
15:30	16:00	
16:00	16:30	
16:30	17:00	
17:00	17:30	
17:30	18:00	
19:00	-	Welcome Cocktail (19:00 - 21:00)

		Monday - August 03
Room		Louvre I + II + III + IV
08:00	08:30	Opening Ceremony
08:30	09:00	
09:00	09:30	Fourier Lecture
09:30	10:00	
10:00	10:30	Coffee Break
10:30	11:00	Nukiyama Memorial Award Ceremony and Lecture
11:00	11:30	
11:30	12:00	ICHMT Awards & Luikov Medal Lecture
12:00	12:30	
12:30	13:00	
13:00	13:30	Lunch
13:30	14:00	
14:00	14:30	AIHTC Diamond Jubilee Ceremony & William Begell Medal Ceremony and Lecture
14:30	15:00	
15:00	15:30	
15:30	16:00	Coffee Break
16:00	16:30	AUTSE Special Session
16:30	17:00	
17:00	17:30	
17:30	18:00	

		Tuesday - August 04					
Room		Louvre I + II	Louvre III + IV	Segóvia I + II	Alhambra I	Alhambra II	El Pardo II
08:00	08:30	Panel 1 : Sunny Li / Fei Duan (Microchips & Data Centers)			Poster 1 : MN + Multiphysics	Poster 2 : Energy A (Storage + HX)	Poster 3 : HT Fund A (Convection-A)
08:30	09:00						
09:00	09:30						
09:30	10:00						
10:00	10:30	Coffee Break					
10:30	11:00	Keynote 1 : Plawsky	Keynote 2 : Yan	Keynote 3 : Saury			
11:00	11:30						
11:30	12:00	Keynote 4 : Murakami	Keynote 5 : Mikielewicz	Keynote 6 : Rein			
12:00	12:30						
12:30	13:00	Lunch					
13:00	13:30						
13:30	14:00	Keynote 7 : Caliot	Keynote 8 : Colaço	Keynote 9 : Craig			
14:00	14:30						
14:30	15:00	Keynote 10 : Suzuki	Keynote 11 : McDonald	Keynote 12 : Cao			
15:00	15:30						
15:30	16:00	Coffee Break					
16:00	16:30	Panel 2 : Pavlenko (Boiling and Evaporation)			Poster 4 : Apps A (Comb + Elec)	Poster 5 : IP + AI	Poster 6 : HT Fund B (Coupled + Rad)
16:30	17:00						
17:00	17:30						
17:30	18:00						

		Wednesday - August 05					
Room		Louvre I + II	Louvre III + IV	Segóvia I + II	Alhambra I	Alhambra II	El Pardo II
08:00	08:30	Panel 3 : Le Masson / Rousseau (High-T Property Characterization)			Poster 7 : Phase A (Boiling-A + Multi-A)	Poster 8 : Energy B (Sustain + Env)	Poster 9 : Solution Methods
08:30	09:00						
09:00	09:30						
09:30	10:00						
10:00	10:30	Coffee Break					
10:30	11:00	Keynote 13 : Groulx	Keynote 14 : Moita	Keynote 15 : Buliński			
11:00	11:30						
11:30	12:00	Keynote 16 : Baelmans	Keynote 17 : Hoffmann	Keynote 18 : Choi			
12:00	12:30						

		Thursday - August 06				
Room		Louvre I + II	Louvre III + IV	Segóvia I + II	Alhambra I	Alhambra II
08:00	08:30	Panel 4 : Groulx (Tech Articles Publishing)	Panel 5 : Di Marco (Space & Planetary)		Poster 10 : Apps B (Bio + Elec)	Poster 11 : HT Fund C (Conv-B + Turb + Cond)
08:30	09:00					
09:00	09:30					
09:30	10:00					
10:00	10:30	Coffee Break				
10:30	11:00	Keynote 19 : Das	Keynote 20 : Mantelli	Keynote 21 : Dombrovsky		
11:00	11:30					
11:30	12:00	Keynote 22 : Bianco	Keynote 23 : Sadhal	Keynote 24 : Haiwang Li		
12:00	12:30					
12:30	13:00	Lunch				
13:00	13:30					
13:30	14:00	Keynote 25 : Tanda	Keynote 26 : Shahi	Keynote 27 : van Hout		
14:00	14:30					
14:30	15:00	Keynote 28 : Scholl	Keynote 29 : Elbel	Keynote 30 : Lee		
15:00	15:30					
15:30	16:00	Coffee Break				
16:00	16:30	Panel 6 : Battaglia/Maillet/ Berger (Inverse + DL)	Panel 7 : Qun Chen (Carbon Neutrality)		Poster 12 : Phase B (Multi-B + Melting)	Poster 13 : Therm. & Props
16:30	17:00					
17:00	17:30					
17:30	18:00					
19:00	-	Conference Banquet (19:00-23:00) - Room Asia				

		Friday - August 07		
Room		Louvre I + II	Alhambra I	Alhambra II
08:00	08:30	Panel 8 : Shahi (Thermal Energy Storage)	Poster 14 : Apps C (Aero + Mat)	Poster 15 : Phase C (Boiling-B)
08:30	09:00			
09:00	09:30			
09:30	10:00			
10:00	10:30	Coffee Break		
10:30	11:00		Poster 16 : Energy C (Storage-B)	Poster 17 : Phase D (Boiling + Multi)
11:00	11:30			
11:30	12:00			
12:00	12:30			
12:30	13:00	Closing Ceremony		
13:00	13:30			

AWARD CEREMONIES

THE NUKIYAMA MEMORIAL AWARD

Monday, August 03, 10:30 – Room LOUVRE

The Nukiyama Memorial Award has been established by the Heat Transfer Society of Japan to commemorate outstanding contributions by Shiro Nukiyama as an excellent heat transfer scientist. Nukiyama addressed the challenges of boiling phenomena and published a pioneering paper, which clarified these phenomena in the form of the Nukiyama curve (boiling curve). This epoch-making work was done in 1930s, when heat transfer research was in an early stage and Nukiyama himself was young, under forty years old. The Nukiyama Memorial Award is bestowed to a scientist under/ about fifty years of age, once every two years in the field of Thermal Science and Engineering. **The recipient of the 2026 Nukiyama Memorial Award is Prof. Masahiro Nomura.**

INTERNATIONAL CENTRE FOR HEAT AND MASS TRANSFER – ICHMT

Monday, August 03, 11:30 – Room LOUVRE

Fellowship Award: ICHMT fellows are elected from ICHMT members in recognition of administrative or organizational services provided to the Centre, such as successful organization of International Symposia, Seminars, Advanced Courses or other scientific events, contributions to ICHMT publishing Activities, or long and active service on the Executive Committee or Scientific Council. **The recipient of the 2025 ICHMT Fellowship Award is Professor Hideo Yoshida.**

Hartnett-Irvine Award: The Hartnett-Irvine Award is given annually to the best paper on heat or mass transfer presented at a conference, symposium or seminar organized or co-sponsored by ICHMT in the previous year. The Award has been established to honor the lives and memory of James P. Hartnett and Thomas F. Irvine, founders of ICHMT and outstanding leaders in the fields of energy resources and heat and mass transfer research. **The recipient of the 2024 ICHMT Hartnett-Irvine Award is Professor Pedro J. M. Coelho.**

Luikov Medal Award: The Luikov Medal is dedicated to Aleksey Vasilievich Luikov. It is awarded for outstanding contributions to the science and art of Heat and Mass Transfer and for activities in international scientific cooperation in conjunction with ICHMT programs. **The recipient of the 2024 Luikov Medal Award is Professor M. Pinar Mengüç.**

THE WILLIAM BEGELL MEDAL AWARD

Monday, August 03, 14:00 – Room LOUVRE

The William Begell Medal, For Excellence in Thermal Science and Engineering was established in 2010 by The Assembly for International Heat Transfer Conferences, AIHTC, International Centre for Heat and Mass Transfer, ICHMT, and Begell House Inc. to award an individual, from among those selected to deliver Keynote lectures at the IHTC Conferences, who is held in high regard by the heat transfer community for his/her contributions and excellence in thermal science and technology and whose IHTC Keynote paper is judged to make a profound contribution to the thermal science and engineering literature. In 2023, the Award Steering Committee amended the William Begell Medal to be bestowed upon an internationally recognized, highly accomplished researcher and leader in fundamentals or applications of thermal sciences and engineering based on lifetime achievements. **The recipient of the 2026 William Begell Medal Award is Prof. Yogesh Jaluria.**

PLENARY LECTURES

THE FOURIER LECTURE

Monday, August 03, 9:00 – 10:00, Room LOUVRE

FOURIER AND THE DEPRESSURIZED CONDUCTION COOL-DOWN OF A MICRO MODULAR REACTOR

Charl G Du Toit, North-West University, South Africa

Abstract:

The Advanced Micro Reactor is a high temperature gas-cooled prismatic block reactor, being designed to produce 10 MW thermal power. The active core consists of an inner graphite reflector, fuel graphite block assemblies arranged in three rings and an outer graphite reflector. The system code Flownex SE has been used to set up an axi-symmetric network model of the reactor to study the thermal-hydraulic behaviour of the reactor under steady-state conditions and during a Depressurized Loss of Forced Cooling event. The helium coolant enters the reactor through the outer annulus of a co-axial duct, flows up in the risers in the outer reflector to the upper plenum, down through the core and exists the lower plenum through the inner pipe of the co-axial duct. Under steady-state conditions the top of the core is cooler than the bottom of the core. During the depressurized loss of forced cooling the reactor endeavours to heat up the upper part of the core, cool down the lower part of the core and set-up the required temperature gradient in the radial direction to remove the decay heat and the excess heat accumulated in the solids. When the depressurized loss of forced cooling starts and the reactor is scrammed, the fuel temperatures drop steeply, along with the drop in power, until they are in equilibrium with the corresponding graphite temperatures and then follow the graphite temperatures as the decay heat decreases and the graphite heats up or cools down. The heating and cooling of the core is demonstrated by the rates at which the fuel and solids accumulate and release heat during the depressurized loss of forced cooling. A study of the heat balance during the depressurized loss of forced cooling also shows that a large of the heat rejected by the reactor cavity cooling system is due to the stored heat being released by the solids. The movement of the heat through the reactor is primarily determined by thermal conduction heat transfer (Fourier) assisted by radiation heat transfer (Stefan-Boltzmann) and convection heat transfer (Newton).

Short Bio:

Jat du Toit is an emeritus professor of Mechanical Engineering and the emeritus DSI/NRF SARChI Research Chair in Nuclear Engineering at the North-West University, Potchefstroom, South Africa. He obtained a B.Eng. (Hons.)(Civil) and a M.Eng.(Civil) from the University of Stellenbosch and a Ph.D. from the University of Cambridge. He has published more than 100 papers in international and national journals and conference proceedings and was the co-editor of the proceedings of two conferences. He is a registered professional engineer with

practical experience in the fields of civil, mechanical, chemical, metallurgical, and nuclear engineering and focuses on the numerical modeling of thermal-fluid processes. He is a partner of the commercial engineering software development and consulting firm M-Tech Industrial which develops and markets the system CFD code Flownex SE. His current interests are the development of advanced thermal-fluid simulation models for high temperature gas-cooled nuclear reactors and associated cooling systems using a systems CFD approach. He has been a senior technical consultant for the Pebble Bed Modular Reactor (PBMR) project. Along with his colleagues he has made contributions on the influence of the packing structure of pebble bed on the thermal-hydraulic phenomena, as well as the interaction between the reactor unit and the reactor cavity cooling system for pebble bed reactor and prismatic block reactor-based systems. He has served as President of the South African Association for Theoretical and Applied Mechanics and as Secretary of the Assembly for International Heat Transfer Conferences.

THE NUKIYAMA MEMORIAL AWARD LECTURE

Monday, August 03, 10:30 – 11:30, Room LOUVRE

FROM PHOTONICS TO PHONONICS: NANOSCALE THERMAL ENGINEERING

Masahiro Nomura, The University of Tokyo, Japan

Abstract:

Heat conduction control in a semiconductor membrane by nanostructuring will be discussed from the viewpoint of photonics. We classify the systems by similarity, difference, and hybridization of photons and phonons, and explain characteristic thermal phonon transport in each system. Prospects for thermal phonon engineering will be also discussed.

Light propagation in ray optics and thermal phonon transport at the nanoscale are similar due to ballisticity. The characteristic propagation of light and mechanical vibrations in band-engineered periodic structures, i.e. photonic and phononic crystals, derives from the wave properties of electromagnetic and elastic waves. Some recent work on the control of heat conduction by well-designed nanostructures has been taken up to discuss how we can design nanostructures to control heat transport more effectively by considering the similarity and difference of photons and thermal phonons [1]. The ballistic behavior of phonons in their mean free path (MFP) allows advanced heat flux control such as directional heat flux and heat focusing. This thermal phonon behavior is similar to ray optics and is therefore named “Ray phononics” [2]. The selection of phonon *k*-vector direction by aligned nanoholes formed in a membrane result in the formation of directional heat flux. The directional heat flux is maintained within the MFP of thermal phonons. The interaction and hybridization of photons and phonons are also interesting and will lead to new functionality. Phonons can control the emission of a single photon from a quantum dot embedded in a high-*Q* optical micro/nanocavity [3, 4].

Regarding hybridization, phonons can travel faster by four orders of magnitude by shaking hands with photons: forming surface phonon polaritons (SPhPs) leading to the enhancement of thermal conduction in thin dielectric membranes. This dramatic change in thermal energy transport property by SPhPs opens new possibilities for thermal management in thin membranes [5]. The hydrodynamic behavior of phonons is an example of a different transport phenomenon that is a phenomenon rarely observed in optics. The collective behavior, which exists in electronic and phononic systems due to interaction, of phonons provides interesting thermal transport such as phonon Poiseuille flow [6]. We demonstrate the first thermal Tesla valve [7], thermal diode, as an example of applications.

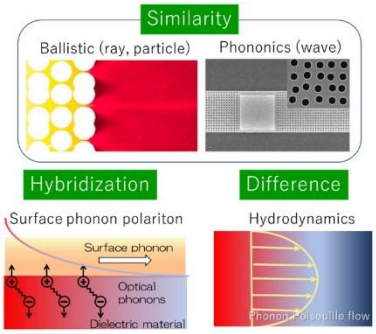


Figure 1. Discusses thermal phonon transport, categorizing photon and phonon similarities, differences, and hybridization.

References
[1] M. Nomura, et al., Mater. Today Phys. 22, 100613 (2022). [Invited Review paper]
[2] R. Anufriev and M. Nomura, Mater. Today Phys. 15, 100272 (2020).
[3] M. Nomura, Nat. Nanotechnol., 11, 496 (2016).
[4] M. Nomura, et al., Nat. Phys. 6, 279 (2010).
[5] Y. Wu, et al., Sci. Adv. 6, eabb4461 (2020).
[6] X. Huang, et al., Nat. Commun., 14, 2044 (2023).
[7] X. Huang, et al. Nature 634, 1086 (2024).

Short Bio:

Dr. Masahiro Nomura was born in Tokyo, Japan in 1977. He obtained his BE, ME, and Ph.D. degrees from The University of Tokyo in 2000, 2002, and 2005, respectively. After serving as a JSPS postdoctoral fellow, he joined the Institute of Industrial Science at The University of Tokyo, where he served as Project Research Associate (2005-2010) and Associate Professor (2010-2022), and currently serves as Professor (2022-present). He served as Deputy Director of the institute (2023-2024), Advisor to the President of The University of Tokyo (2024-2026) and currently serves as Special Advisor to the President of The University of Tokyo.

Since 2010, Dr. Nomura has founded and led the Integrated Quantum Electronics Lab, pursuing interdisciplinary quantum transport physics and device applications including phonon/heat transfer phenomena at nano- and microscales, thermoelectric energy harvesting, and semiconductor chip cooling. Making a bold transition from quantum electronics to thermal engineering, he has established himself as a world-leading scholar in phonon engineering within 15 years. He serves as Director of the LIMMS/CNRS-IIS International Research Laboratory and leads the Phonon Engineering Research Community of The Japan Society of Applied Physics with over 300 members. He serves as councilor of Thermoelectrics Society of Japan and holds editorial positions at Applied Physics Express, Japanese Journal of Applied Physics, and ThermoX.

His contributions span fundamental physics to practical applications. By introducing his original concept “From photonics to phononics,” he has created new paradigms in thermal science. His work includes establishing Ray Phononics, demonstrating directional heat flow control through ballistic phonon transport, realizing phonon hydrodynamic behavior in graphite leading to the thermal Tesla valve, and achieving enhanced thermal transport via surface phonon-polaritons. These achievements have redefined understanding of heat

transfer at nano- to microscales. He has published over 180 refereed journal papers with more than 6,000 citations and an h-index of 40 (Web of Science), authored 10 books, and delivered over 100 plenary and invited talks at international conferences. His research excellence is recognized through 20 prestigious awards, including the 16th JSPS Prize (2019) recognizing him among the top 25 Japanese researchers under 45, the German Innovation Award Gottfried Wagener Prize (2018), and the Docomo Mobile Science Award (2024).

Through visionary leadership in integrating photonics, electronics, fluid dynamics, and mathematics into thermal engineering, Dr. Nomura has advanced fundamental understanding while developing transformative technologies. His work bridges quantum phenomena and macroscopic applications, establishing new frontiers that will contribute to shaping the future of thermal science and engineering.

THE LUIKOV MEDAL AWARD LECTURE

Monday, August 03, 11:30 – 13:00, Room LOUVRE

FROM RADIATIVE TRANSFER AND LIGHT SCATTERING TO OPEN CASCADED TRANSPORT

M. Pinar Mengüç, Özyeğin University, Turkey

Abstract:

Transport formulations have long provided a rigorous framework for describing how energy carriers propagate, interact, attenuate, scatter, and redistribute across space and time. From Fourier's diffusion equation to Boltzmann's kinetic theory and the radiative transfer equation, the central concern has been to connect microscopic or directional interactions with observable macroscopic behavior. This connection is especially important when such processes are coupled through material structure, boundary conditions, irreversible interactions, and external fields.

This lecture follows a personal scientific path from radiative transfer and light scattering research carried out by the author and his groups over many years toward broader transport-based descriptions of complex systems. In participating media, radiative transfer is expressed through an integro-differential formulation. Related equations arise for carriers such as electrons, phonons, and neutrons. Although the carriers may differ, their interactions can often be interpreted through transport formulations rooted in Boltzmann's kinetic description.

Examples from past research, including optical diagnostics for particle characterization, micro- and nanoscale heat transfer, near-field radiation, light–matter interaction in structured media, and electron-beam processing, will be used to show how transport thinking can connect measurement, modeling, and material response. In reacting and multiphase systems, light scattering can be used to determine particle size, shape, concentration, and morphology. At small length scales, coherence, resonance, tunneling, and near-field coupling modify classical radiative exchange. In electron-beam processing and nanoscale fabrication, localized energy deposition requires coupling between electron transport, phonon response, and evolving material structure. These examples show how transport formulations can move across scales while retaining a common mathematical discipline.

The lecture will then address a broader question: can transport theory be extended to open complex systems? Many systems of current interest are multiscale, history-dependent, and organized through evolving interfaces. Their behavior is not always governed by a single conserved physical carrier. Instead, cascaded exchanges take place among multiple carriers and domains. Such systems may also involve memory effects, boundary-mediated coupling, and sources or sinks that do not fit classical equilibrium closures. Technological networks, built environments, ecosystems, cities, and coupled socio-technical systems exhibit such behavior.

The lecture will conclude with a brief discussion of Open Cascaded Transport, proposed as an extension of transport-based formulations to coupled, open, and history-dependent systems.

The purpose of this new approach is to examine whether concepts developed for the transport of energy and matter can also help analyze how organized structure is transmitted, transformed, and sometimes sustained in complex systems beyond the traditional boundaries of the field.

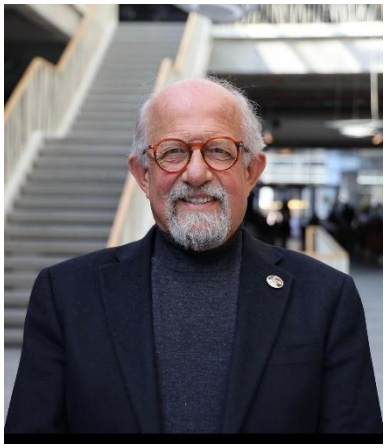
Short Bio:

M. Pinar Mengüç is FYE Endowed Chair Professor at Özyeğin University, Istanbul, where he is also the founding Director of the Center for Energy, Environment and Economy (CEEE/EÇEM). He received his PhD in Mechanical Engineering from Purdue University in 1985 and joined the University of Kentucky that same year, becoming a full professor in 1993. He was later appointed Engineering Alumni Association Chair Professor at the University of Kentucky. In 2009, he joined Özyeğin University as the founding Head of Mechanical Engineering and established CEEE/EÇEM. He has held visiting appointments at the Università degli Studi di Napoli Federico II, Harvard University/Massachusetts General Hospital, and the University of California, Los Angeles.

His research interests include radiative transfer, light scattering, inverse radiation problems, optical diagnostics, particle characterization, near-field thermal radiation, nanoscale energy transport, electron-beam transport, and sustainable energy systems. His work has contributed to radiation transport modeling in participating media, inverse characterization of particles and complex media, transport-based analysis of photons, phonons, and electrons, and applications of thermal sciences to energy and environmental systems.

Professor Mengüç has authored or co-authored more than 160 journal articles, more than 240 conference papers, seven books, and several patents. He has supervised more than 70 MS, PhD, and postdoctoral researchers and has delivered more than 140 invited, keynote, and plenary lectures. From 2006 to 2024, he served as one of the Editors-in-Chief of the *Journal of Quantitative Spectroscopy and Radiative Transfer*. He is a Fellow of ASME and ICHMT, a member of the Science Academy of Türkiye, and has served in executive roles in several scientific and professional organizations, including the Science Academy and ICHMT.

His honors include the 2018 ASME Heat Transfer Memorial Award, the 2020 Purdue University Outstanding Mechanical Engineer Award, the 2023 Michael I. Mishchenko Medal, the 2024 METU Parlar Foundation Honor Award, and the A.V. Luikov Medal of the International Centre for Heat and Mass Transfer.



THE WILLIAM BEGELL MEDAL AWARD LECTURE

Monday, August 03, 14:00 – 15:30, Room LOUVRE

HEAT TRANSFER AS A PRIMARY DRIVER OF NATURAL PHENOMENA AND TECHNOLOGY

Yogesh Jaluria, Rutgers – The State University of New Jersey, USA

Abstract:

Nature is fascinating, enchanting, and often mysterious. The beauty of softly falling snow, the warmth of the Sun on cold wintry days, intoxicating evening breeze in the summer, and raindrops falling on our roofs are among the many lovely ways in which we see our natural world. Nature can also be bewildering and terrifying. This includes natural events ranging from earthquakes, hurricanes, tsunamis, and tornadoes that can cause widespread destruction to droughts, floods, mudslides, forest fires, snowstorms, and many other extreme weather conditions that can affect millions. Nature has amazing power and can disrupt the lives of all those who inhabit this lovely planet. Interestingly, thermal energy transport is behind much of what we observe in Nature. We receive much of our energy from the Sun and reject energy to space, resulting in an annual periodic variation in heat transfer to and from the Earth. An energy imbalance would lead to global warming, which has been a growing concern in recent years. Temperature and moisture concentration differences in Earth's gravitational field drive most of the flows that we observe in the atmosphere and in the lakes and oceans. Temperature differences also generate flows that give rise to Earth's magnetic field that deflects the stream of charged particles from the Sun and helps preserve our atmosphere. Heat transfer is also behind the movement of tectonic plates, earthquakes and volcanoes. Wildfires are obviously driven by combustion and are thus closely linked with heat transfer. Similarly, heat transfer plays a critical role in determining our weather and climate. All living creatures are affected by thermal energy, and evolution has equipped them with the means to cope with weather extremes. We are familiar with plants and trees bending to catch greater amount of sunlight. The thermal cycle experienced by lakes and rivers as well as hot springs and geysers also depend on the thermal transport. These and many other natural phenomena that we enjoy or are concerned about have heat transfer as a primary driver.

Similarly, many technological advancements have been driven by heat transfer processes. From heating, air conditioning, cars and airplanes to manufacturing, food processing, and thermal management of electronic system, heat transfer is at the very core of the systems involved. We cannot talk about data centers without discussing their cooling. Thermal processing is critical in a wide range of materials like food, polymers and steel. Power plants as well as renewable energy systems are largely driven by heat transfer processes. In many cases, we have a strong coupling between natural processes and technology, for instance, in heat rejection, thermal pollution and climate change. Data center cooling could be linked with environmental conditions for more effective thermal management. Many of the advancements in new and emerging materials and devices are also driven by thermal transport processes. Many other important processes and systems can be mentioned where thermal energy transport is critical to the quality of the resulting product and process efficiency. This talk focuses on the wide-ranging impact of heat transfer in driving natural

phenomena as well as technological innovation and advancement. The basic mechanisms by which heat transfer drives the flows in nature or sustains various systems in technology are discussed. The link between natural phenomena and technology is examined with respect to areas like climate change, thermal pollution, energy extraction, safety and sustainability. Nature-based design and optimization are critical in many cases and are discussed.

Short Bio:

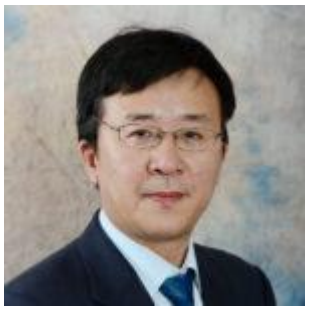
Dr. Yogesh Jaluria is Board of Governors Professor and Distinguished Professor at Rutgers, the State University of New Jersey. His research work is in the field of thermal science and engineering, covering areas like convection, fires, materials processing, thermal management of electronics, energy, and environment. He is the author/co-author of 10 books and the editor/coeditor of 18 books. He has contributed over 600 technical articles, including over 230 in archival journals and 22 book chapters. He has received several awards and honors for his work, such as the prestigious 2020 Holley Medal from the American Society of Mechanical Engineers (ASME) for pioneering achievements in optical fiber drawing, 2010 A.V. Luikov Award from the International Center for Heat and Mass Transfer (ICHMT) in recognition of outstanding work done over his career, the 2007 Kern Award from the American Institute of Chemical Engineers (AIChE), the 2003 Robert Henry Thurston Lecture Award from ASME, and the 2002 Max Jakob Memorial Award, the highest international recognition in heat transfer, from ASME and the AIChE. He received the 2000 Freeman Scholar Award and the 1995 Heat Transfer Memorial Award from ASME. He has served as Department Chairman and as Interim Dean of Engineering. He served as Editor-in-Chief of the Journal of Heat Transfer and as Editor of Computational Mechanics. He currently serves as Editor of Annual Review of Heat Transfer. He is an Honorary Member of ASME, and a Fellow of AAAS, ASTFE and APS. He served as the President of the American Society of Thermal and Fluids Engineers (ASTFE) from 2014 to 2019.

PANEL DISCUSSIONS

Panel	Title	Organizers	Day	Time
Panel 1	Cooling and Thermal Management for Microchips and Data Centers	Sunny Li (U. British Columbia) and Fei Duan (Nanyang Tech. U.)	Tue, Aug 04	08:00–10:00
Panel 2	Boiling and Evaporation: New Challenges for Modern Technology	Aleksandr Pavlenko (Kutateladze Inst. Thermophysics)	Tue, Aug 04	16:00–18:00
Panel 3	Characterization of Physical Properties at High Temperature. Experiments, Instrumentations, and Uncertainties	Philippe Le Masson (Univ. Bretagne Sud) and Benoit Rousseau (Polytech Nantes)	Wed, Aug 05	08:00–10:00
Panel 4	Technical Articles: Review and Publishing	Dominic Groulx (Dalhousie U.)	Thu, Aug 06	08:00–10:00
Panel 5	Heat Transfer Challenges for Space and Planetary Exploration	Paolo Di Marco (U. Pisa)	Thu, Aug 06	08:00–10:00
Panel 6	Inverse Techniques and Deep Learning in Heat Transfer	Jean-Luc Battaglia (U. Bordeaux), Denis Maillet (U. Lorraine) and Julien Berger (U. La Rochelle)	Thu, Aug 06	16:00–18:00
Panel 7	Towards Carbon Neutrality of High-Carbon Industries with Renewables	Qun Chen (Tsinghua Univ.)	Thu, Aug 06	16:00–18:00
Panel 8	Heat and Mass Transfer in Thermal Energy Storage	Mina Shahi (U. Twente)	Fri, Aug 07	08:00–10:00

PANEL 1: COOLING AND THERMAL MANAGEMENT FOR MICROCHIPS AND DATA CENTERS
Tuesday, August 04, 8:00 – 10:00, Room LOUVRE I + II

Organizers: Sunny Li and Fei Duan
University of British Columbia, Canada and Nanyang Technological University, Singapore



Panelists:

Qiuwang Wang, School of Energy & Power Engineering, Xi'an Jiaotong University, China

Bingyang Cao, School of Aerospace Engineering, Tsinghua University, China

Yogendra Joshi, School of Mechanical Engineering, Georgia Institute of Technology, USA

Kazuyoshi Fushinobu, Department of Mechanical Engineering, Institute of Science Tokyo, Japan

Ali Kosar, Department of Mechatronics Engineering, Sabanci University, Turkey

Abstract:

Worldwide, both the technology innovation and economy heavily rely on microchips. With emerging manufacturing breakthroughs, microchips are becoming more powerful and compact. Effective, feasible, and reliable cooling solutions are needed for addressing the challenges of transferring more heat through smaller areas while still maintaining the chip temperature within its safety range. Researchers are striving to advance various cooling technologies for microchips such as immersion cooling, liquid impingement cooling, spray cooling, cold-plate cooling, etc. in which micro/nano technologies have been developed for enhancing near-junction heat transfer. Microchips are the heart and major heat source of data centers (DCs), which are highly demanded for artificial intelligence training, big data mining, e-commerce, Internet of Things, and so on. The DC sector is one of the fastest growing consumers of electricity in the world. The most effective way to improve power usage effectiveness is to reduce the cooling power consumption in DCs with new DC designs and novel cooling methods. The goal of this panel is to identify challenges, discover opportunities, and exchange views and ideas about the cooling and thermal management ranging from the chip level to the facility level in DCs. Focus will also be put on the relation and integration of the thermal management solutions at the multiple levels. The invited panelists have extensive experience but different research foci in the fields. They will briefly introduce their research findings. Most of the panel time will be dedicated to the interaction between the panelists and the audience, and the audience participation is highly encouraged and expected.

PANEL 2: BOILING AND EVAPORATION: NEW CHALLENGES FOR MODERN TECHNOLOGY
Tuesday, August 04, 16:00 – 18:00, Room LOUVRE I + II

Organizer: Aleksandr Pavlenko, Russian Academy of Sciences, Russia

Panelists:

Pei-Xue Jiang, Department of Energy and Power Engineering, Tsinghua University, Beijing, China.

Matteo Bucci, Massachusetts Institute of Technology, Nuclear Science and Engineering Department, Cambridge, MA, USA.

Qiuwang Wang, Xi'an Jiaotong University, School of Energy and Power Engineering, Xi'an, China.

Abstract:

High-intensity heat transfer regimes at boiling and evaporation are essential for a number of modern technologies that require the removal of high heat flux densities at relatively low superheats. Within the framework of this Panel Session, a comprehensive analysis of the current state of development of methods for enhancing heat transfer and controlling extreme heat transfer processes at boiling and evaporation in various hydrodynamic conditions is planned. The session will discuss the ways, tendencies and critical aspects of the effective future use of boiling and evaporation regimes in power engineering, micro- and power electronics, the chemical industry, cryogenic technology and metallurgy. Prospective and problematic issues regarding the development of methods for cooling modern electronics with high and ultrahigh heat fluxes will also be discussed.

The specifics of developing methods to increase the critical heat flux while simultaneously increasing the heat transfer coefficient at bubble boiling will be considered. Recent advances in experimental boiling research enabled by the emergence of unique high-fidelity facilities and non-intrusive, high-resolution optical diagnostics will be discussed. The prospects for using artificial intelligence (AI) methods in the design of advanced engineered surfaces to intensify heat transfer during boiling and evaporation in relation to the development of modern heat and mass transfer equipment and heat-stressed cooling systems will be analyzed. Attention will also be focused on new requests from thermal physicists for materials science technologies for constructing specified structures on a heat transfer surface for the effective control of two-phase flows and interfacial heat transport processes on the micro-nanoscale.

In the first part, each invited scientist will give a brief talk on a specific topic based on his research area which will present the current status of our research, existing achievements, problems and challenges and future outlooks. The second part will be a discussion among invited experts on the above hot topics. The third part is open discussion between the invited speakers and the audience. We hope that all interested specialists in this Panel Session will actively participate in debate, and forward-looking discussions are strongly encouraged. We hope that the successful work of this panel will inspire new ideas, approaches, and lead to new promising innovations for all researchers in the field.

PANEL 3: CHARACTERIZATION OF PHYSICAL PROPERTIES AT HIGH TEMPERATURE. EXPERIMENTS, INSTRUMENTATIONS, AND UNCERTAINTIES.
Wednesday, August 05, 8:00 – 10:00, Room LOUVRE I + II

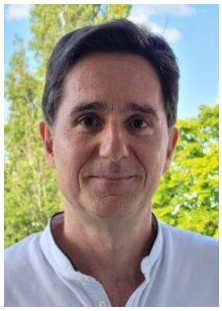
Organizers: Philippe LE MASSON and Benoit ROUSSEAU
Univ. Bretagne Sud and Polytech Nantes, France

Panelists:

Fabio S. Faria, LETA, IEM-E/ITA, São José dos Campos, SP, Brazil

Arthur V. S. Oliveira, LETeF, EESC/USP, São Carlos, SP, Brazil

Dr Gherhardt Ribatski, LETeF, EESC/USP, São Carlos, SP, Brazil



Dr Denis Rochais, CEA, Monts, France

Abstract:

Industrial process modeling using multiphysics approaches is increasingly common and leads to complex models. Data input for predictive simulations requires essential knowledge of physical properties that may be temperature-dependent. The scientific literature lists numerous physical properties for all types of materials, regardless of their nature. However, material characterization becomes more complex when they reach and exceed their melting point, i.e., in the liquid state. For liquid metals, literature is scarce at high temperatures. The problems encountered at high temperatures are numerous: chemical reactions between the sample and its support or the surrounding environment; significant non-linearizable radiative losses; the need for specific experimental setups; and the impossibility of using intrusive sensors (thermocouples). Nevertheless, many of these problems can be circumvented through specific experiments such as levitation experiments (electromagnetic, electrostatic, and aerodynamic). Among the properties determinable by these experiments are heat capacity, density, viscosity, and surface tension, based on observable parameters such as temperature/irradiance and sample diameter. The challenge related to the complexity of the experiments is, firstly, to manage the complexity of the simulation and, secondly, to quantify the measurement uncertainties (of the observables) in light of the simulation validation. Underlying this is the question of whether to construct a simulation of the sensor's intrusiveness in order to closely approximate the experimental simulation. Here, we propose to discuss the instruments used in thermal or mechanical stress experiments and the recording of observables (high-speed visible cameras, multispectral pyrometers), their limitations (sensitivity studies), and, above all, the quantification of uncertainties (noise, correlation matrices, etc.).

PANEL 4: TECHNICAL ARTICLES: REVIEW AND PUBLISHING
Thursday, August 06, 8:00 – 10:00, Room LOUVRE I + II

Organizer: Dominic Groulx, Dalhousie University, Canada

Panelists:

Sandra Boetcher, Mechanical Engineering, Embry-Riddle Aeronautical University

Yogesh Jaluria, Mechanical and Aerospace Engineering, Rutgers University

Andrea Luke, Institut für Thermodynamik, University of Kassel

Gennady Ziskind, Mechanical Engineering, Ben-Gurion University of the Negev

Abstract:

The amount of scientific and technical published work has been increasing at an exponential rate in the past decade, to the point where some are calling for large changes in the peer-review and publication process to alleviate the pressure on the entire system, from overworked editors, and the availability and quality of reviews, to the risk of “paper mills” that are uncovered every so often and changes that AI could bring to the writing and publication model. As a community, one might state that too many papers are submitted and not enough reviewers are available, which can quickly erode the long-standing quality control that peer-review has been offering.

So, as the community of heat transfer researchers, can actions be taken to help reduce pressure on the system? Would a better uniform understanding of standards and publication expectations help? Should training in the critical review of publications be part of graduate teaching? What else could be done? Those questions, and many more, will be discussed by a panel of current and past journal editors and associate editors, along with all attendants to the panel, in hopes of moving the needle towards a more sustainable approach to publication.

PANEL 5: HEAT TRANSFER CHALLENGES FOR SPACE AND PLANETARY EXPLORATION
Thursday, August 06, 8:00 – 10:00, Room LOUVRE III + IV

Organizer: Paolo Di Marco, DESTEC, University of Pisa, Italy

Panelists:

Matteo Bucci, Department of Nuclear Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, USA

Marco Marengo, Department of Civil Engineering and Architecture, University of Pavia, Italy

Peter Stephan, Technical University of Darmstadt, Institute of Technical Thermodynamics, Darmstadt, Germany

Jinjia Wei, School of Chemical Engineering and Technology, Xi'an Jiaotong University, Xi'an, China

Abstract:

The renewed global momentum in space and planetary exploration brings a host of fresh challenges in heat transfer. Managing heat is crucial—not only for the thermal control of electronics, antennas, and other onboard systems, but also for designing HVAC solutions for planetary habitats and supporting everyday activities such as cooking.

In reduced or zero gravity, many of the familiar heat-transfer mechanisms we rely on—natural convection and pool boiling among them—lose their effectiveness because they depend on buoyancy. As a result, solutions that work seamlessly on Earth require substantial rethinking for space applications.

Thermal energy storage offers one promising route, helping to smooth peak demand and limit the power requirements of thermal management systems. But meeting these challenges efficiently will require new ideas, innovative strategies, and entirely new device concepts.

Reduced-gravity environments also offer a unique scientific opportunity: they allow us to observe physical mechanisms that are otherwise masked by gravity, opening the door to insights that may ultimately benefit terrestrial technologies as well.

These opportunities—spanning fundamental research, improved modeling and design tools, and the exploration of novel engineering concepts—will be the focus of this panel discussion.

PANEL 6: INVERSE TECHNIQUES AND DEEP LEARNING IN HEAT TRANSFER
Thursday, August 06, 16:00 – 18:00, Room LOUVRE I + II

Organizers: Jean-Luc Battaglia, Denis Maillet and Julien Berger
Université de Bordeaux, Université de Lorraine and Université de La Rochelle, France



Panelists:


Mohamed Salim Bidou - Université Paris Nanterre


Suelen Gasparin- CEREMA, France


Gudipati Sai Krishna - Indian Institute of Technology Madras, Chennai, India

Cesar Cunha Pacheco - Fluminense Federal University, Brazil

Abstract:

Processing large quantities of data, identifying or reducing physical models, or solving inverse problems are areas of application that numerous researchers in direct or inverse heat transfer have been addressing for over 30 years. More recently artificial intelligence has become a prevalent subject, with numerous applications developed in society and in various sciences. For a few years, one of its branches, Machine Learning, is the subject of a large quantity of papers, particularly in the heat transfer community. It is primarily based on developing models, with different structures (or architectures), that can be calibrated (trained) in various ways. However, distinguishing what is genuinely new and interesting in Deep Learning from what scientists have been using for a long time is not easy, because of the use of a terminology that differs from the one previously used. For example, the Inverse Heat Conduction Problem can be considered as based on a direct problem whose structure is an Artificial Neural Network belonging to the Shallow Learning category, that is with 3 layers (input, hidden and output) here. The objective of the panel, based on several flash oral presentations selected from the papers presented elsewhere in the conference, is to try to define the interests/lack of interests (pro and con) of recent deep learning techniques for solving inverse problems (parameter or function estimation) in heat transfer.

PANEL 7: TOWARDS CARBON NEUTRALITY OF HIGH-CARBON INDUSTRIES WITH RENEWABLES
Thursday, August 06, 16:00 – 18:00, Room LOUVRE III + IV

Organizer: Qun Chen, Tsinghua University, Beijing, China

Panelists:

Pavel Strizhak, Tomsk Polytechnic University, Russia

Yoichi Murakami, Institute of Science Tokyo, Japan

Jinjia Wei, Xi'an Jiaotong University, China

Zhibin Yu, University of Liverpool, UK

Haiwang Li, Beihang University, China

Christos Markides, Imperial College London, UK

Min Soo Kim, Seoul National University, South Korea

Abstract:

Renewable energy, or green energy, is becoming the driving power of more and more industrial and civil sectors in recent years. However, two important sectors, steel and chemical engineering industry, are hard to work with renewable energy, as they require long-term steady energy input while renewable energy is intrinsically fluctuating and intermittent. Therefore, their carbon emissions are still intense and remain to be reduced. It is highly required to find an effective solution to integrate renewable energy with the two sectors, thereby promoting their low carbon transition. Facing this challenge, we organize a panel and invite worldwide interdisciplinary leading scientists to serve as panelists. They are expected to present their precious wisdom and exchange their opinions. We also welcome all participants in this field to the panel and look forward discussions. We hope that this panel will inspire new ideas and lead to innovations for all researchers in this field.

PANEL 8: HEAT AND MASS TRANSFER IN THERMAL ENERGY STORAGE
Friday, August 07, 8:00 – 10:00, Room LOUVRE I + II

Organizer: Mina Shahi, University of Twente, Netherlands

Panelists:

Dominic Groulx, Dalhoise University, Canada

Ken Craig, University of Pretoria, South Africa

Yuwen Zhang, University of Missouri, USA

Hanna Lösch, DLR, Germany

Abstract:

Thermal energy storage (TES) is becoming increasingly important for the integration of renewables into heating and cooling systems. For heating, TES enables peak shaving and load shifting, including seasonal storage aspects; for cooling, both daily (day–night) and seasonal shifts are essential. Regional demands vary significantly, with some contexts prioritizing cooling and others heating. Alongside established approaches such as soil, water, and geothermal storage, phase change materials (PCMs) play a crucial role. Their complex melting and freezing behavior requires advanced CFD modelling, especially as many PCMs show supercooling and segregation. A deeper understanding of these phenomena and improved modelling strategies are central to current research and will be addressed in this panel discussion.

KEYNOTE LECTURES

Lecture	Title	Lecturer	Day	Time
Keynote 1	Change-of-Phase Heat Transfer in Microgravity	Joel Plawsky (RPI, USA)	Tue, Aug 04	10:30–11:30
Keynote 2	Recent Advances in Heat Transfer for Energy Storage and Thermal Management	Yuying Yan (U. Nottingham, UK)	Tue, Aug 04	10:30–11:30
Keynote 3	Impact of Radiation on Natural Convection Flows of a Participating Gas: Illustrations, Issues and Challenges through Some Examples	Didier Saury (Institut PPRIME, France)	Tue, Aug 04	10:30–11:30
Keynote 4	Thermal Energy Storage and High-Performance CO2 Capture by Covalent Organic Frameworks: New Functions, Structures, and Applications Explored with Periodic Nanoporous Materials	Yoichi Murakami (Inst. Sci. Tokyo, Japan)	Tue, Aug 04	11:30–12:30
Keynote 5	Dissipation Energy in Modelling of Complex Flows	Dariusz Mikielewicz (Gdańsk Tech, Poland)	Tue, Aug 04	11:30–12:30
Keynote 6	The Fire Within: Understanding Wildfires Through the Lens of Heat Transfer	Guillermo Rein (Imperial College, UK)	Tue, Aug 04	11:30–12:30
Keynote 7	Probabilistic Heat Transfer for Improved Urban Climate Predictions	Cyril Caliot (UPPA/CNRS, France)	Tue, Aug 04	13:30–14:30
Keynote 8	Inverse Problems and Optimization in Heat Transfer	Marcelo J. Colaço (UFRJ, Brazil)	Tue, Aug 04	13:30–14:30
Keynote 9	CFD Simulation of Phase Change Heat Transfer – Modelling of Melting and Solidification in Industrial and Solar Applications	Ken Craig (U. Pretoria, South Africa)	Tue, Aug 04	13:30–14:30
Keynote 10	Laser Diagnostics of Ammonia Flames toward Carbon Neutrality	Yuji Suzuki (U. Tokyo, Japan)	Tue, Aug 04	14:30–15:30
Keynote 11	Advanced Thermal-Sprayed Coatings for Heating of Reinforced Polymer Composite Structures and Metal Pipes	André McDonald (U. Alberta, Canada)	Tue, Aug 04	14:30–15:30
Keynote 12	Thermal Design Automation for Multiscale Thermal Managements of Electronic Systems	Bingyang Cao (Tsinghua, China)	Tue, Aug 04	14:30–15:30
Keynote 13	Comparison Metrics and Design Rules for Phase Change Material Based Thermal Energy Storage Systems: International Efforts and Progress	Dominic Groulx (Dalhousie, Canada)	Wed, Aug 05	10:30–11:30
Keynote 14	Experimental Methods to Characterize Two-Phase Flows in Microfluidic Devices: From Sustainable Industrial Applications to Biomedicine	Ana S. Moita (IST, Portugal)	Wed, Aug 05	10:30–11:30
Keynote 15	Different Approaches for Modeling Blood Flow through Native and Bioprosthetic Aortic Valve	Zbigniew Buliński (Silesian, Poland)	Wed, Aug 05	10:30–11:30
Keynote 16	Generative Design of Heat Sinks and Heat Exchangers: Advancements in Topology and Shape Optimization	Martine Baelmans (KU Leuven, Belgium)	Wed, Aug 05	11:30–12:30
Keynote 17	Heat Transfer and Pressure Drop in a Packed Bed of Crushed Rock Thermal Energy Storage System	Jaap Hoffmann (Stellenbosch, South Africa)	Wed, Aug 05	11:30–12:30
Keynote 18	Innovative Thermal-Hydraulic Performance Validation to Advance SMR Technologies through State-of-Art Separate Effect Test Campaigns	Ki Yong Choi (KAERI, Korea)	Wed, Aug 05	11:30–12:30
Keynote 19	Gradient Bio-Microfluidics: Thermo-Chemical Transport in Organs on a Chip Models	Sarit K. Das (IIT Madras, India)	Thu, Aug 06	10:30–11:30
Keynote 20	Advances in Heat Pipe Technology for Electronic Cooling	Marcia B. H. Mantelli (UFSC, Brazil)	Thu, Aug 06	10:30–11:30
Keynote 21	Recent Advances in Modeling Solar-Induced Melting of Tibetan Lake Ice and Arctic Sea Ice	Leonid A. Dombrovsky (JIHT, Russia)	Thu, Aug 06	10:30–11:30
Keynote 22	Generative Design to Overcome Challenges and Shape the Future of Heat Transfer Design	Nicola Bianco (U. Napoli, Italy)	Thu, Aug 06	11:30–12:30
Keynote 23	Measurements of Biotransport Properties of Ocular Tissue for Drug Delivery Modeling	Satwindar Sadhal (USC, USA)	Thu, Aug 06	11:30–12:30
Keynote 24	Integrated Coupling Analysis of Electric Power and Thermal Energy Management Systems in Hybrid-Electric Propulsion (HEP)	Haiwang Li (Beihang, China)	Thu, Aug 06	11:30–12:30
Keynote 25	Infrared Thermal Imaging in Exercise Science: Applications, Insights, and Modeling	Giovanni Tanda (U. Genova, Italy)	Thu, Aug 06	13:30–14:30
Keynote 26	Thermochemical Energy Storage for the Heat Transition: Advancing Heat Storage and Upgrade Solutions	Mina Shahi (U. Twente, Netherlands)	Thu, Aug 06	13:30–14:30
Keynote 27	Heat and Mass Transfer Characteristics of Coaxial Round Jets	René van Hout (Technion, Israel)	Thu, Aug 06	13:30–14:30
Keynote 28	Electrifying Distillation Processes through Mechanical Vapor Recompression: From Potential Analysis to Conceptional Equipment Design	Stephan Scholl (TU Braunschweig, Germany)	Thu, Aug 06	14:30–15:30
Keynote 29	Measurement and Improvement of Air-Side and Refrigerant-Side Heat Transfer in High-Performance Heat Exchangers	Stefan Elbel (TU Berlin, Germany)	Thu, Aug 06	14:30–15:30
Keynote 30	Unveiling New Insights into Interfacial Phenomena with Surface Plasmon Resonance Imaging	Seong Hyuk Lee (Chung-Ang U., Korea)	Thu, Aug 06	14:30–15:30

KEYNOTE LECTURE 1: CHANGE-OF-PHASE HEAT TRANSFER IN MICROGRAVITY

Joel Plawsky (Rensselaer Polytechnic Institute Troy – New York, USA)

Tuesday, August 04, 10:30–11:30, Room LOUVRE I + II

Chair: Dominic Groulx

Abstract

Change of phase heat transfer processes are critical to thermal management, fuel management, and water recovery on Earth and in microgravity. The Space Shuttle and International Space Station made long-duration studies of phase change possible. We have run a number of experiments on the ISS in this area looking particularly at heat pipes and flow boiling and condensation. Heat pipes combine thermal conduction, liquid-vapor phase change, and often, capillary flow, to transport energy efficiently between a heat source and a heat sink. Since, a heat pipe's fluid circulation is driven by interfacial forces, the devices operate without any moving parts, which makes them simple, light, and reliable: perfect for space exploration. Transparent, wickless heat pipes of square cross-section were operated in the microgravity environment aboard the International Space Station off and on for the past 15 years to map the liquid-vapor interface and liquid film thickness profiles and understand the fluid flow and heat transfer characteristics of their operation in microgravity. Partly due to the low thermal conductivity of the glass walls, as heat inputs were increased, thermal Marangoni flows developed that flooded the heater end and in the shortest version, a form of slow-motion boiling. In the most recent version of the device, a 50:50 binary liquid mixture was used to offset the problematic thermal Marangoni flow. The mixture formed a self-sustaining oscillator that improved performance and was precise enough to serve as a rudimentary clock. Recently, we have been looking at transients and instabilities during flow boiling and condensation. The goal was to understand how changes in flow rate and heater inputs affect boiling and condensation processes in microgravity in the regime prior to critical heat flux. Subcooled flow boiling is promising for space applications since it can control the motion of bubbles near the heated surface and enhance nucleate boiling. We performed flow boiling experiments using n-perfluorohexane in a rectangular channel. The comparison of results of μg and 1g experiments, demonstrates that when the vapor quality is low, gravity plays only a small role in the mechanisms behind flow boiling. Gravity does not appear to affect when critical heat flux occurs at the flow rates tested. A correlation linking the wall superheat temperature to the total heat duty, was developed to quantify these effects.

KEYNOTE LECTURE 2: RECENT ADVANCES IN HEAT TRANSFER FOR ENERGY STORAGE AND THERMAL MANAGEMENT

Yuying Yan (University of Nottingham – Nottingham, UK)

Tuesday, August 04, 10:30–11:30, Room LOUVRE III + IV

Chair: Sergey Alekseenko

Abstract

In recent years, energy storage and thermal management have become two of the most important topics in global energy, sustainability, and technical advancement, and their prominence is continuing to grow. The progress of heat transfer ensures innovative development of various energy storage systems and thermal management strategies in-line with relevant high quality technical requirements. In the present paper, our recent advances in heat transfer in developing high-temperature phase-change thermal energy storage with salts as media, and the applications of nano enhanced phase change material (PCM) and micro-encapsulated PCMs for power electronic thermal management are summarized and reported. High-temperature phase-change thermal energy storage with salts as media has shown promising potential in power peak shifting, industrial waste heat recovery, concentrated solar power, etc. However, like most PCMs, their thermal conductivities are normally low, and the corrosivity is high, which makes the current metal-based heat transfer enhancement technologies unapplicable. In the present study, open-cell ceramic foam is developed from molecular mechanism to material preparation, and its compatibility with salts is assessed using advanced characterization technologies. The heat transfer enhancement performance of ceramic foam is demonstrated for both melting and solidification processes in a shell-and-tube unit. Different configurations of ceramic foam, including pore size, porosity, filling height and outer diameters, are included and optimized to obtain a trade-off between energy storage capacity and rate. The energy storage performance of ceramic foam/salt composite PCM is also evaluated in an integrated system and shows superiority in both storage rate and capacity. Meanwhile, the PCMs are applied to the thermal management of power electronics such as MOSFET and li-batteries. To overcome the limitations and challenges of low thermal conductivity, leakage, and corrosion of PCMs, by using microfluidics method, microencapsulated PCMs capsules as conduits for heat transfer, enabling efficient exchange between the PCM and its surroundings, are developed. The thermal performance under varying PCMs, pin fin shapes, and volume ratios was numerically evaluated. Results show that microencapsulated PCMs could reduce average temperature, improve temperature uniformity, and lower peak temperature difference. In addition, the application of physics-informed neural networks (PINNs) is also explored in modelling fluid flow and heat transfer within intricate geometric configurations, focusing on manifold microchannel (MMC) heat sinks designed for efficient high-power IGBT cooling.

KEYNOTE LECTURE 3: IMPACT OF RADIATION ON NATURAL CONVECTION FLOWS OF A PARTICIPATING GAS: ILLUSTRATIONS, ISSUES AND CHALLENGES THROUGH SOME EXAMPLES

Didier Saury (Institut PPRIME, France)

Tuesday, August 04, 10:30–11:30, Room SEGOVIA I + II

Chair: Pedro Coelho

Abstract

Natural convection flows are known to be highly sensitive to perturbations that can significantly impact their behavior. In such flows, radiation acts as a perturbation: gas radiation disturbs the convective motion by modifying the temperature of the fluid, whereas surface radiation modifies the boundary conditions. The interaction between natural convection and radiation gives rise to complex situations that are difficult to predict due to the intricate interplay of the phenomena influencing the flow topology and regime, transition thresholds to unsteadiness or turbulence, and, more broadly, the stability of the flow. This coupled convection-radiation problem is of paramount importance in many aspects related to closed, air-filled spaces, where even at ambient temperature, the water vapor contained in the air plays a significant role. Even more challenging situations occur in mixtures when an absorbing species diffuses into another gas. These are the well-known double diffusion convection flows, where mass and thermal gradients drive buoyancy forces simultaneously. Depending on the situation, gas radiation can either promote or stabilize flow instabilities. One of the main challenges in simulations when gas radiation is considered is finding a suitable gas absorption model. In such situations, the latest versions of global models based on k-distributions (SLW, FSK and ADF) provide reliable tools. This paper presents a review of some typical case studies of coupled natural convection and radiation, with data from experiments or numerical simulations. These involve canonical configurations such as differentially heated cavities, thermal plumes or localized heat sources. The aim is to provide a perspective on real-life situations involving convection-radiation coupling and the available methods and tools for analyzing and solving them, as well as the issues that arise.

KEYNOTE LECTURE 4: THERMAL ENERGY STORAGE AND HIGH-PERFORMANCE CO2 CAPTURE BY COVALENT ORGANIC FRAMEWORKS: NEW FUNCTIONS, STRUCTURES, AND APPLICATIONS EXPLORED WITH PERIODIC NANOPOROUS MATERIALS

Yoichi Murakami (Institute of Science Tokyo, Japan)

Tuesday, August 04, 11:30–12:30, Room LOUVRE I + II

Chair: Michel De Paepe

Abstract

Recently, a new class of crystalline porous solids called 'Covalent Organic Frameworks (COFs)' has emerged. Different from previous porous materials, COFs are the first kind of crystalline porous solids composed of only light elements (typically C, H, N, and O) and formed by thermally and chemically robust covalent bonds. (Note: "crystalline" means having a periodic structure and a defined pore size.) COFs' structure and function can be designed largely by choosing building block molecules called monomers; typically, two kinds of monomers having different reaction 'hands' are poly-condensed to form COFs in a liquid solution. Because of the unique advantages of COFs, numerous applications have been proposed so far. The presenter's research career began with studies of heat exchangers and heat sinks (see bio). After several changes of his research subjects, the presenter has noticed that COFs have large potential also for the heat-and-mass transfer and thermal engineering field. The purpose of this lecture is to introduce (i) COFs as an emerging material platform, (ii) an example of a new thermal engineering material using COFs, (iii) examples of our new-structure developments that have broadened the structural diversity of COFs, and (iv) an example of how a new structure development led to a creation of novel engineering function. Specifically, for (ii), it will be shown that the introduction of sugar alcohols into the nanopores of COFs solved the long-standing problem of large supercooling associated with sugar alcohols. For (iii), our topological control and new topology creations of COFs are presented. For (iv), our recent example of developing a new COF structure that resulted in superior CO2 capture and separation performances will be shown. Finally, an outlook for COF research and the potential relation to the heat-and-mass transfer community will be noted.

KEYNOTE LECTURE 5: DISSIPATION ENERGY IN MODELLING OF COMPLEX FLOWS
Dariusz Mikielewicz (Gdańsk University of Technology, Poland)
Tuesday, August 04, 11:30–12:30, Room LOUVRE III + IV
Chair: Sandra Boetcher

Abstract

Generally the classical methods of modelling complex flows such as for example flow boiling fall into three categories, namely strictly empirical (the heat transfer coefficient is an empirical correlation usually presented in function of Martinelli parameter), based on superposition of convective and nucleate boiling effects (however the way in which superposition is introduced has no theoretical background), and finally phenomenological models. Understanding of the physics of local boiling in various regimes, namely in subcooled, saturated and post-dryout flow regimes inside heated channels is still unsatisfactory, which makes its understanding incomplete, and still the analysis of the flow boiling issue is very challenging. Similar situation is found in case of flow condensation or other complex flow cases. An alternative approach to modelling convective flows where dispersion of energy is present is offered by considerations of dissipation energy. The energy in general is an additive property and it is this feature of that entity that has been used in the examples presented. Attention was focused on modelling flows with boiling or condensation under saturated, subcooled and superheated conditions. The proposed approach was applied to the analysis of mist flow and supercritical heat transfer. In these cases too, consistent results were obtained, which confirm the ability of the presented modelling to predict complex flows with heat transfer and non-linear effects. It should also be noted that the approach to obtaining a solution in a complex flow based on the summation of dissipation energies has also worked well in other cases such as bubbly flow in the boundary layer.

KEYNOTE LECTURE 6: THE FIRE WITHIN: UNDERSTANDING WILDFIRES THROUGH THE LENS OF HEAT TRANSFER

Guillermo Rein (Imperial College, UK)

Tuesday, August 04, 11:30–12:30, Room SEGOVIA I + II

Chair: Qiuwang Wang

Abstract

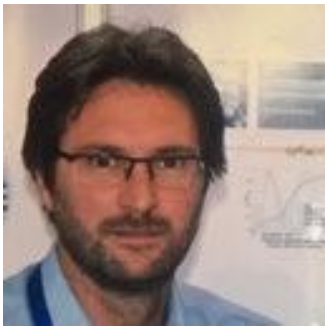
Wildfires are natural hazards that are growing in destructive power, and their behaviour is fundamentally driven by heat transfer. To understand how wildfires ignite, spread, and are suppressed, we must examine the interplay of conduction, convection, and radiation within complex, porous biomass fuels and across scales from the micro to the landscape. This keynote explores wildfire dynamics through the lens of heat transfer. I will discuss how these transport processes govern ignition thresholds, fire spread modes (surface, crown, and ground), firebrand generation, and transitions between flaming and smouldering combustion. These mechanisms often lead to nonlinear and unexpected fire behaviours, especially under dry and windy conditions. Examples from recent destructive wildfires, including urban events like London 2022 and Los Angeles 2025, illustrate how heat transfer drives fire growth across both natural and built environments. I will also highlight recent advances in modelling, experimentation, and sensing that improve our ability to understand, predict, and manage fire behaviour. Understanding wildfires as thermochemical systems is essential for designing safer communities and adapting to a future of more intense and frequent fires. The science of heat transfer offers a powerful framework for mastering the hazards of fire and safeguarding society.

KEYNOTE LECTURE 7: PROBABILISTIC HEAT TRANSFER FOR IMPROVED URBAN CLIMATE PREDICTIONS

Cyril Caliot (UPPA/CNRS, France)

Tuesday, August 04, 13:30–14:30, Room LOUVRE I + II

Chair: Victoria Timchenko



Abstract

Our cities are getting hotter, particularly during heatwaves, which impacts our comfort and energy bills. It is crucial to predict how heat moves through complex urban areas, from buildings to streets, in order to design cooler, more sustainable cities. However, current methods struggle to cope with the complexity of urban landscapes. This paper introduces a revolutionary computer model that addresses this challenge. Using the sophisticated Monte Carlo technique, our model can accurately simulate combined heat transfer in complex city geometry, accounting for precise thermal and solar radiative heat transfers. Unlike previous models, ours can handle intricate city designs with ease, enabling us to understand the combined effects of conduction, convection and radiation. We have demonstrated the high accuracy of our model, even in detailed 3D city environments. For example, we used it to simulate a heatwave, demonstrating that planting trees can significantly cool streets during the day, although they might slightly reduce night-time cooling. This new tool will empower researchers to improve the coupling of building energy models with urban climate models, and ultimately create cities that are more comfortable and energy-efficient for all.

KEYNOTE LECTURE 8: INVERSE PROBLEMS AND OPTIMIZATION IN HEAT TRANSFER
Marcelo J. Colaço (UFRJ, Brazil)
Tuesday, August 04, 13:30–14:30, Room LOUVRE III + IV
Chair: Paolo Di Marco

Abstract

Inverse problems rely on estimating unknown quantities that cause a system's response. In heat transfer problems, these quantities may include boundary and/or initial conditions, as well as the material's thermophysical properties. The response is typically a temperature field that can be measured either intrusively or at the material's boundaries. Inverse problems are mathematically classified as ill-posed, whereas standard heat transfer problems are well-posed. A solution to a well-posed problem must satisfy conditions of existence, uniqueness, and stability with respect to the input data. The existence of a solution to an inverse heat transfer problem can be proven through physical reasoning. However, the uniqueness of inverse problem solutions can be mathematically proven only in special cases. Additionally, inverse problems are sensitive to random errors in measured input data and require specialized techniques to satisfy the stability condition. Optimization problems, on the other hand, aim to obtain the optimal solution to a given problem based on a desired objective. In the context of heat transfer, for instance, optimization problems can determine the optimal magnetic field distribution to minimize natural convection effects during the solidification of an electrically conducting material. The solution to an optimization problem does not need to be unique; it only needs to satisfy the given objective. Many inverse problem techniques are formulated as minimization problems, for which optimization techniques are employed. Some classical deterministic techniques include the conjugate gradient method, the Levenberg-Marquardt method, and the BFGS method, among others. Other techniques, known as heuristics, include genetic algorithms, particle swarm optimization, and differential evolution methods, as well as many new ones that have emerged in recent years. Although optimization techniques are easy to use, they require significant computational effort to iteratively minimize the required cost function in complex problems. Some types of inverse problems can be reformulated as boundary problems. One technique that allows this is the Reciprocity Functional Method. In this case, the solution can be obtained analytically. Although the problem formulation becomes much more complex than with classical methods, the final expression is fully analytical, and solving the inverse problem takes a fraction of a second. Many applications of this technique have been developed in recent years, demonstrating its potential to rapidly solve inverse problems without any intrusive measurements. This paper addresses solution methodologies for inverse and single-objective optimization problems based on minimization techniques, as well as recent advances using the Reciprocity Functional Method and future prospects.

KEYNOTE LECTURE 9: CFD SIMULATION OF PHASE CHANGE HEAT TRANSFER – MODELLING OF MELTING AND SOLIDIFICATION IN INDUSTRIAL AND SOLAR APPLICATIONS

Ken Craig (University of Pretoria, South Africa)

Tuesday, August 04, 13:30–14:30, Room SEGOVIA I + II

Chair: Gennady Ziskind

Abstract

The keynote paper will summarize the modelling approaches available for the melting and solidification simulation in Computational Fluid Dynamics (CFD) codes. Methods that will be covered include the enthalpy-porosity (EP) method, the apparent heat capacity method (AHC) and the optimum enthalpy (OE) approach (all fixed-grid methods), especially as they impact latent heat and velocity transition modelling. An overview will include a discussion of phase change materials (PCMs) being used for thermal storage applications. Of interest here are the thermal properties required by the CFD models and the role and extent of the mushy zone or the temperature interval of phase change. Thereafter the paper will present various case studies of phase change material (PCM) enclosures aimed at enhancing the melting performance by varying container shape, heating method and geometry, and orientation relative to the gravitational vector. CFD modelling parameters that influence the accuracy of the validation will be discussed, especially as to how the efficiency and accuracy of the modelling process can be increased. The role of CFD modelling to enhance the understanding of PCM melting above that possible from experimental studies will be emphasized. Here the role of convection heat transfer in the melt is especially of interest. For solar applications, the determination of the heating profile is illustrated. Turning to solidification, the modelling of the formation of a freeze lining between the slag layer and refractory in an open-arc furnace will be presented. Special emphasis will be placed on speeding up the solution time through the use of a calibrated wall-function approach. The calibration will be done with a high-resolution CFD model of the freeze lining formation using a selection of the above approaches.

KEYNOTE LECTURE 10: LASER DIAGNOSTICS OF AMMONIA FLAMES TOWARD CARBON NEUTRALITY

Yuji Suzuki (The University of Tokyo, Japan)

Tuesday, August 04, 14:30–15:30, Room LOUVRE I + II

Chair: Peter Stephan

Abstract

Ammonia (NH3) has attracted increasing attention as a carbon-free fuel toward carbon neutrality. The inherent combustion properties of NH3, such as a low burning velocity and high NOx emissions, present significant challenges for its direct use as a fuel. These challenges underscore the necessity of further investigations into NH 3 combustion. In NH3 flames, the H atom and OH radical are deeply involved in the decomposition of NH3 and in both NOx formation and DeNOx processes. Therefore, information on H and OH distributions in NH3 flames is crucial for developing high-fidelity kinetic models. However, LIF measurements of H atom distributions remain challenging in NH3 flames. This is because two-photon excitation at 205 nm suffers from artifacts due to the photodissociation of NH3 itself. In this study, in NH3 counterflow diffusion flames, quantitative measurements of H concentrations using TALIF and semi-quantitative measurements of OH using linear LIF have been carried out, and the measurement data were compared with predictions from recent NH3 reaction models. The present results indicate that the temperature dependence of H- and OH-related reactions in previous NH3 kinetic models should be revisited.

KEYNOTE LECTURE 11: ADVANCED THERMAL-SPRAYED COATINGS FOR HEATING OF REINFORCED POLYMER COMPOSITE STRUCTURES AND METAL PIPES

André McDonald (University of Alberta, Canada)

Tuesday, August 04, 14:30–15:30, Room LOUVRE III + IV

Chair: Wilko Rohlfs

Abstract

The Advanced Heat Transfer and Surface Technologies Laboratory at the University of Alberta was created with a view to conducting industry-relevant research in the area of thermal-sprayed surface modifications and to provide experiential research training to students and other practitioners. Since its inception in 2008, the Laboratory has successfully advanced research programs on development and functionalization of thermal-sprayed coatings and determination of material and wear properties of coatings. In particular, work has also been undertaken on the development of smart coatings for structure damage detection and coatings for resistive heating of fiber-reinforced polymer materials. In this presentation, a detailed discussion of recent experimental and modelling work relating to the fabrication, performance testing, and analysis of flame-sprayed resistive heating coatings for applications on polymer materials, steel pipes, airfoils, and membranes for water reclamation will be presented. The presentation will highlight the microstructure of the coatings, the effect of microstructure on the operational heating performance of the coatings, and mathematical modelling that has enabled qualification of the heat transfer performance of the coatings on various substrates. Throughout the presentation, it will be emphasized that the research can be viewed as a nexus of selected elements of mechanical engineering, materials science, and heat transfer.

KEYNOTE LECTURE 12: THERMAL DESIGN AUTOMATION FOR MULTISCALE THERMAL MANAGEMENTS OF ELECTRONIC SYSTEMS

Bingyang Cao (Tsinghua University, China)

Tuesday, August 04, 14:30–15:30, Room SEGOVIA I + II

Chair: Wilson Chiu

Abstract

Modern semiconductor devices face critical thermal management challenges as power densities increase and feature sizes approach nano/microscale dimensions where classical Fourier's heat conduction laws break down. Traditional chip design approaches that rely primarily on only electrical designs and external cooling solutions are insufficient to address the complex, multiscale nature of thermal transport in advanced integrated circuits. This perspective presents a comprehensive Thermal Design Automation (TDA) framework, as a complementary extension to traditional Electronic Design Automation (EDA) tools, that systematically integrates thermal simulation and management methods across all length scales of semiconductor design. The TDA approach begins with first-principle calculations and machine learning potentials to predict atomic-scale thermal properties, and lattice dynamics simulations to predict interfacial phonon transmission. These fundamental properties parameterize phonon Monte Carlo simulations that solve the Boltzmann transport equation to capture non-Fourier heat spreading within transistors, while self-heating effects are simulated by solving fundamental semiconductor device equations. For larger scales, finite element methods and compact thermal models bridge the gap to circuit- and die-level thermal analysis and design, while advanced liquid cooling technologies address chip-level heat dissipation. Through multiscale thermal simulation and design optimization, the TDA framework enables systematic reduction of transistor heat generation, minimization of device and chip thermal resistance, and acceleration of chip design cycles, thereby enhancing overall performance and reliability. This integrated framework addresses the fundamental limitations of existing macroscopic thermal simulation tools and establishes a new EDA+TDA paradigm for thermal-aware semiconductor design that can systematically tackle the multiscale thermal bottlenecks limiting further technological advancement in modern electronics.

KEYNOTE LECTURE 13: COMPARISON METRICS AND DESIGN RULES FOR PHASE CHANGE MATERIAL BASED THERMAL ENERGY STORAGE SYSTEMS: INTERNATIONAL EFFORTS AND PROGRESS

Dominic Groulx (Dalhousie University, Canada)

Wednesday, August 05, 10:30–11:30, Room LOUVRE I + II

Chair: Xing Zhang

Abstract

A major impediment to the development and technological/economical acceptance of phase change material (PCM) based thermal energy storage (TES) systems is the lack of systematic design rules. Currently, for any given application, PCM-based TES must be selected through expensive and lengthy trial-and-error testing involving prototyping, construction and experimental characterization campaigns. These points were raised during a Keynote presentation at the International Heat Transfer Conference in 2018 (Beijing). How has the field progressed towards the development of design rules in the last 8 years? Recognizing these important limitations, the TES research community has implemented series of research programs, through individual researcher's labs culminating in international coordinated research efforts, including the new joint Task 74/47 from the International Energy Agency (IEA) titled Components for Thermal Energy Storage with a subtask dedicated to TES Design. The first step needed towards design rules is the development of comparison metrics. Various possible approaches are currently studied, using traditional metrics such the effectiveness, UA-values, or based on dimensionless numbers such as the Nusselt number, and new metrics altogether, from normalizing system power to system storage capacity, to understanding the impact of the heat transfer driving force on potential metrics. This Keynote lecture will present on the state of research and development on comparison metrics and design rules for these systems, with the aim again of helping the heat transfer community at large understand the important questions to tackle to move the field significantly forward. The hope is to leave the lecture with more questions than answers, and prompt important future contributions from researchers, old and new, in the field.

KEYNOTE LECTURE 14: EXPERIMENTAL METHODS TO CHARACTERIZE TWO-PHASE FLOWS IN MICROFLUIDIC DEVICES: FROM SUSTAINABLE INDUSTRIAL APPLICATIONS TO BIOMEDICINE

Ana S. Moita (Instituto Superior Técnico, Universidade de Lisboa, Portugal)

Wednesday, August 05, 10:30–11:30, Room LOUVRE III + IV

Chair: Tassos Karayiannis

Abstract

Microscopic phenomena occurring at liquid-solid interfaces govern fluid flow and heat transfer mechanisms in different micro and macro industrial applications. The characterization of these flows is complex, particularly at the microscale, where surface forces dominate and enhance effects, which are usually neglected at larger scales. This lecture introduces a micro-to-macro scale approach for the detailed characterization of vapor and liquid phases, with particular emphasis on the quantification of velocity fields, temperature gradients and heat flux analysis. Different advanced diagnostic techniques are combined and used in various applications. Main case studies focus on recent developments of heat sinks based on microgeometries for flow boiling cooling. These geometries explore microchannels with non-uniform geometries (e.g. divergent channels, wavy shaped channels and flows around microcavities/micropillars). In this context, an entire methodology is presented and discussed, comprising a custom-made optimization tool based on a genetic algorithm, to define the geometries to test, and an advanced experimental procedure combining high-speed imaging, post-processing based on machine learning and time and space resolved thermography. (Micro)PIV and PTV are further explored to characterize the velocity fields. The application of this methodology is then shortly demonstrated in a wider range of examples, such as in biomedical flows.

KEYNOTE LECTURE 15: DIFFERENT APPROACHES FOR MODELING BLOOD FLOW THROUGH NATIVE AND BIOPROSTHETIC AORTIC VALVE

Zbigniew Buliński (Silesian University of Technology, Poland)

Wednesday, August 05, 10:30–11:30, Room SEGOVIA I + II

Chair: Kazuya Tatsumi

Abstract

Each year, more than 285,000 people in Europe become eligible for significant valve surgeries, with 16,000 cases reported in Poland alone, a figure that is reportedly increasing. Continued endothelial damage over time is primarily responsible for calcified aortic valve stenosis, the leading cause of valvular heart disease. Two primary procedures address severe VS: prosthetic valve implantation through open heart surgery or transcatheter valve replacement, chosen based on patient age and existing health problems. A crucial aspect of heart valve modeling lies in the establishment of boundary conditions, which are intricately linked to the operational functionality of the left ventricle. To address this, it is essential to incorporate fully three-dimensional valve modeling with fluid–structure interaction (FSI) to accurately capture fine-scale heart hemodynamics. The intricate formation of the heart muscle makes it difficult to tackle, even with comprehensive models, as precise material properties must be established for each heart structures. To get approach that allows for fast, robust and stable simulation of the common relation between left ventricle and aortic heart valve still remain challenging problem. In this paper different methodologies that can be used for modeling blood flow through bioprosthetic valve will be discussed taking into account the FSI techniques as well as approaches for modeling blood flow itself.

KEYNOTE LECTURE 16: GENERATIVE DESIGN OF HEAT SINKS AND HEAT EXCHANGERS: ADVANCEMENTS IN TOPOLOGY AND SHAPE OPTIMIZATION

Martine Baelmans (KU Leuven, Belgium)

Wednesday, August 05, 11:30–12:30, Room LOUVRE I + II

Chair: Denis Maillet

Abstract

Driven by the increased possibilities in manufacturing techniques, advanced computer generated designs, or so-called generative designs, are more and more becoming both seminal and attractive to enhance the performance of heat exchanging components. Adjoint-based optimization methods, such as topology and shape optimization, have well been established to this end. However, their application is still hampered by their high computational cost and the related numerical challenges of full scale device optimization. Particular challenges include conjugate heat transfer problems and devices operating under higher flow rates, eventually entering transitional or turbulent flow regimes. Therefore, the success of generative designs at present still heavily relies on concise decisions in the optimization process; the choice of model approximations, grid resolution, optimization method, the way to account for manufacturability, robustness of the design, and validation of the generative design outcome are all crucial steps towards improvement. In this contribution, the state-of-the-art of topology and shape optimization in heat sinks and heat exchangers will be reviewed. Special focus will be put on the trade-off between computational cost and modeling accuracy, and how to exploit physics-based model reduction in the optimization. Furthermore, the different approaches to account for manufacturing and operational constraints (e.g. to prevent fouling) will be elaborated. Finally, a verification and validation of the generated designs will be presented.

KEYNOTE LECTURE 17: HEAT TRANSFER AND PRESSURE DROP IN A PACKED BED OF CRUSHED ROCK THERMAL ENERGY STORAGE SYSTEM

Jaap Hoffmann (University of Stellenbosch, South Africa)

Wednesday, August 05, 11:30–12:30, Room LOUVRE III + IV

Chair: Francesco Coletti

Abstract

Concentrated solar thermal energy (CSE) is a clean and sustainable form of energy for power generation and process heat especially in countries with a good solar resource. Thermal energy storage (TES) is required for a continuous output to bridge the intermittent solar resource (the diurnal cycle and cloud events). CSE with TES is cost competitive with solar voltaic energy with battery storage when storage time exceed six hours or more. Using air a heat transfer/working fluid, crushed rock TES offers a low-cost CSE solution with minimal environmental impact. The irregular shape of crushed rock particles leads to a pressure drop and heat transfer coefficient that depends on the orientation of particles relative to the main flow direction. Crushed rock results in anisotropic pressure drop and heat transfer in packed beds, invalidating the standard isotropic correlations for packed beds of spheres. This paper discusses particle characterization and the derivation of a representative particle shape, physical experiments with crushed rocks and the representative particle, as well as discrete element (DEM) and computational fluid dynamics (CFD) modelling of packed beds of representative particle shapes done at Stellenbosch University to find a tensor formulation for the pressure loss and heat transfer coefficients for a packed bed of crushed rock. The work concludes with the experimental validation of the tensor model against a packed bed of crushed rock particles.

KEYNOTE LECTURE 18: INNOVATIVE THERMAL-HYDRAULIC PERFORMANCE VALIDATION TO ADVANCE SMR TECHNOLOGIES THROUGH STATE-OF-ART SEPARATE EFFECT TEST CAMPAIGNS

Ki Yong Choi (Korea Atomic Energy Research Institute, Korea)

Wednesday, August 05, 11:30–12:30, Room SEGOVIA I + II

Chair: Dariusz Mikielewicz

Abstract

Small Modular Reactors (SMRs) are emerging as a game changer in the nuclear industry, offering enhanced safety, flexible deployment, and economic scalability. Their compact and innovative designs introduce unique thermal-hydraulic challenges that require precise validation. Various Separate Effect Test (SET) campaigns, alongside Integral Effect Tests (IETs), have become essential to address these challenges. This paper presents ongoing thermal-hydraulic validation efforts using SET campaigns, focusing on an innovative SMR design (iSMR) in Korea. The SET campaigns primarily target validation of innovative passive systems, including a Passive Auxiliary Safety System (PAFS), a Passive Containment Cooling System (PCCS), and a Passive Emergency Core Cooling System (PECCS). In addition, thermal-hydraulic performance and potential instabilities are key concerns due to the selection of a helical-type steam generator as the primary heat exchanger of iSMR. Strategic approaches have been implemented to address performance and safety issues associated with the helically coiled steam generator. Scaling is also a critical aspect in the design of SET facilities. This paper describes the scaling process used to preserve both global and local thermal-hydraulic phenomena of interest. Regarding measurements, extensive efforts have been made to achieve high spatial and temporal resolution, enabling enhanced predictive capabilities, design optimization, and regulatory compliance. Multi-scale validation frameworks further allow confident extrapolation to full-scale SMR designs under both operational and accident conditions. The presentation also addresses strategic implications for the global SMR community, including accelerated licensing, harmonized validation protocols, and prioritization of R&D efforts. Collaborative SET campaigns among academia, national laboratories, and industry foster knowledge transfer and innovation across the SMR development ecosystem. In conclusion, advanced SET campaigns are pivotal for improving SMR thermal-hydraulic understanding, enhancing safety margins, and supporting deployment of next-generation reactors. These efforts strengthen technical robustness, public confidence, and international collaboration in sustainable nuclear energy.

KEYNOTE LECTURE 19: GRADIENT BIO-MICROFLUIDICS: THERMO-CHEMICAL TRANSPORT IN ORGANS ON A CHIP MODELS

Sarit K. Das (Indian Institute of Technology Madras, India)

Thursday, August 06, 10:30–11:30, Room LOUVRE I + II

Chair: Yuji Suzuki

Abstract

Gradients of chemical and physical parameters such as oxygen, nutrients, pH, temperature, and shear stress are fundamental regulators of cellular function and tissue homeostasis in the human body. These physiochemical gradients are inherently dynamic, shaped by diffusion, convection, organ architecture, and metabolic activity and they evolve continuously in response to changing biological conditions. The dynamic nature of chemical and thermal gradients are caused and controlled by transport phenomena related to heat and species diffusion and convection. During pathological events such as ischemia, inflammation, infection, fibrosis, and cancer metastasis, these gradients are often disrupted, leading to altered cell signaling, phenotype, and viability. Clinical interventions, including surgery, drug administration, or implant insertion, can further modify these gradients by imposing abrupt or sustained microenvironmental changes. Understanding how cells respond to such dynamic and heterogeneous gradients is critical for modelling physiology, disease progression, and therapeutic outcomes. Organ-on-a-Chip platforms offer a powerful microfluidic framework to engineer, impose, and control these gradients with high spatial and temporal resolution. Unlike conventional static cultures, these systems allow the application of well-defined imposed gradients (whether stepwise, linear, or dynamic) of oxygen tension, metabolite/drug concentration, shear, or thermal stress. Through vascular-like perfusion, tissue-specific interfaces, and micro-compartmentalization, Organ-on-a-Chip models can mimic complex physiological gradients across critical organ barriers such as the intestinal wall, renal nephrons, or cardiac tissue. This keynote explores the role of imposed gradients in intestine, cardiac and kidney functions using organ-on-a-chip models to decode transport phenomena and cellular behaviour under both healthy and disease-mimicking conditions. In intestine models, both individual and interplay of chemical and thermal gradients are used to investigate bacterial taxis, offering insights into microbiome and infection dynamics. In cardiac-on-a-chip models, gradients of oxygen are engineered to simulate ischemia and reperfusion, enabling analysis of calcium signaling, and mitochondrial stress. Similarly, Kidney-on-a-Chip platforms use hydrostatic pressure, tissue stiffness and solute gradients to replicate nephron-level functions and assess filtration, reabsorption, and drug-induced nephrotoxicity. Shear stress gradients are also investigated to understand their influence on

cancer cell proliferation under drug exposure where metastasis paradoxically increases post-chemotherapy. Overall, this talk will provide a cross-disciplinary perspective, rooted in heat and mass transfer principles on how advanced microfluidic engineering can be leveraged to replicate the complexity of gut, inter organ cancer metastasis, cardiac and renal physiology on-chip. We envision these platforms as testbeds to unravel organ-specific thermo-chemical phenomena that will drive the next generation of in vitro diagnostics, therapeutics, and treatment strategies.

KEYNOTE LECTURE 20: ADVANCES IN HEAT PIPE TECHNOLOGY FOR ELECTRONIC COOLING
Marcia B. H. Mantelli (Federal University of Santa Catarina, Brazil)
Thursday, August 06, 10:30–11:30, Room LOUVRE III + IV
Chair: Sunny Li

Abstract

The increasing thermal demands of compact electronic systems have highlighted the need for efficient and reliable passive heat dissipation technologies. Flat plate heat pipes (FPHPs), due to their compactness, high heat transport capacity, and adaptability, represent a promising solution for managing localized heat loads in devices such as tablets, laptops, CPUs, and aerospace electronics. This paper explores experimental data on the thermal performance of FPHPs with distinct internal configurations, all manufactured via diffusion bonding, a technique that ensures high-precision assembly and structural integrity. Ten configurations were investigated: wire and plate, sintered copper powder, metal mesh, hybrid wick, thermosyphon, pulsating heat pipe (PHP), loop heat pipe (LHP) and another reduced thickness (<1.6 mm) LHP, and two novel structures: a capillary wick made from twisted metallic wires (0.1 mm diameter, commercial electrical wire), and a PHP with a unique wire-based channel geometry. Except for the reduced-thickness LHP (<1.6 mm), all prototypes shared identical external dimensions (100 × 55 mm²), enabling direct performance comparisons under controlled heat input conditions. Deionized and distilled water was used as the working fluid at varying filling ratios. Simple yet precise thermal resistance network models for steady-state operation are presented and compared with experimental data for selected devices. Results show that internal structure, closely tied to the device technology, strongly influences startup behavior, overall thermal resistance, and temperature uniformity. LHPs demonstrated excellent thermal performance even at minimal thickness, making them suitable for space-constrained applications such as smartphones. The twisted-wire wick provided effective heat spreading with simple and low-cost fabrication. The novel wire-based PHP showed stable oscillatory behavior and efficient thermal response. This study contributes to the state of the art in three key ways: (i) it presents an application map linking FPHP configurations to thermal and spatial requirements; (ii) it introduces two innovative and easily manufacturable capillary structures; and (iii) it demonstrates the feasibility of ultra-thin LHPs built via diffusion bonding. The complementary use of sintering was also validated without compromising device efficiency. By combining design diversity with manufacturing precision, this work offers a comparative framework to optimize FPHP selection in advanced electronic systems, providing practical guidance for engineers and researchers developing compact thermal management solutions, particularly for high-performance and embedded electronics where space and efficiency are critical.

KEYNOTE LECTURE 21: RECENT ADVANCES IN MODELING SOLAR-INDUCED MELTING OF TIBETAN LAKE ICE AND ARCTIC SEA ICE

Leonid A. Dombrovsky (Joint Institute for High Temperatures, Russia)

Thursday, August 06, 10:30–11:30, Room SEGOVIA I + II

Chair: Benoit Rousseau

Abstract

The increase in the temperature of the Arctic Ocean over the past years has already been accompanied by an additional melting of sea ice during the polar summer. The change in the Arctic climate is accelerating due to positive feedback. As the ice melts, the Earth receives more solar heat due to the reduction in the reflection of solar radiation from the sea surface. This phenomenon attracts researchers to the problem of solar-induced melting of snow and ice. The processes accompanying the melting of sea ice are very complex. Therefore, it is natural to begin with an interesting problem of spring ice melting on mountain lakes, for which field observations are available. The large high-mountain lakes of Tibet are the most suitable objects for such work, since the sky above these lakes is usually clear and the lake ice is not covered with snow due to the strong wind. The theoretical approach is based on a combination of solutions to two physical problems. Along with spectral radiative transfer in snow or ice with gas bubbles, heat transfer in a medium with volumetric absorption of solar radiation is calculated. The transient energy equation is accompanied by boundary conditions, which include the solar radiation in the opacity range, convective heat transfer, and radiative cooling in the mid-infrared window of the atmosphere. The solution takes into account the motion of the Sun across the sky and contains a description of the local melting/solidification of snow or ice. The computational results of ice melting on one of the Tibetan lakes are in good agreement with field observations. It has been confirmed that the ice on the lake melts from below due to deep absorption of solar radiation. The transition to the problem of sea ice melting is complicated by the need to account for the snow cover. A thin layer of snow only protects the ice from heating and melting. When the snow cover is sufficiently thick, the snow begins to melt and “melt ponds” form on the ice surface. The solar radiation absorbed by these ponds causes the ice to heat up and melt, starting from its upper surface. Approximate theoretical predictions agree well with the observed melting of sea ice. The paper includes a review of the literature on the geophysical problem being addressed. The work is expected to be of interest to many researchers.

KEYNOTE LECTURE 22: GENERATIVE DESIGN TO OVERCOME CHALLENGES AND SHAPE THE FUTURE OF HEAT TRANSFER DESIGN

Nicola Bianco (Università degli Studi di Napoli Federico II, Italy)

Thursday, August 06, 11:30–12:30, Room LOUVRE I + II

Chair: Jean-Luc Battaglia

Abstract

Heat transfer challenges span a wide range of scales, from microscale thermal management in electronics to large-scale systems like building envelopes and thermal energy storage for renewable energy. Addressing these challenges effectively necessitates a shift in design paradigms. Generative design approaches, and particularly Topology Optimization (TO), have emerged as powerful tools in thermal system design. When combined with advanced manufacturing methods such as Additive Manufacturing (AM) and CNC milling, TO enables unprecedented geometric freedom and significant performance enhancements. Inspired by nature laws via bio-based approaches, say accounting for the evolutionary tendency of finite systems to enhance their flow efficiency like in the well-known Constructal law, generatively designed components mimic nature free-form, generating optimized structures. However, unlike biological systems that evolve over both space and time, engineered systems rely on computational and fabrication tools to achieve similar advancements. Within this context, together with topology-optimized structures where the structures are not known a-priori, several strategies allow to generate efficient heat transfer structures, ranging from predefined cellular or lattice architectures, e.g., body-centered cubic arrays, honeycombs, or triply periodic minimal surfaces (TPMS), to more advanced, optimization-driven TO based approaches. Lattice-based structures are relatively straightforward to implement and can be personalized to meet specific thermal requirements. At a more advanced level, TO enables the systematic derivation of high-performance designs by maximizing or minimizing objective functions, e.g., thermal resistance, under constraints like mass, volume, or pumping power. The integration of TO with computational fluid dynamics (CFD), and the ability of AM and CNC milling to fabricate intricate geometries, is paving the way for next-generation thermal devices with enhanced heat dissipation and overall thermal performance. Nonetheless, significant challenges remain. TO and cellular design approaches are computationally intensive, often constrained by manufacturability limits, and currently lack seamless integration with novel materials. Addressing these limitations is crucial to fully exploiting the capability of these technologies. This keynote will explore the current state and future directions in optimized thermal system design, including developments in heat sinks, heat exchangers, and multifunctional thermal structures. Emphasis will be placed on how recent

advances in computational design and lifecycle-aware optimization strategies can improve not only thermal efficiency but also practical implementation. Finally, the keynote will highlight emerging trends that aim to extend beyond conventional TO, e.g., the embedding of cellular topologies, multi-scale optimization strategies, and the promising ground of field optimization, which seeks to directly design spatial property distributions based on underlying physical laws.

KEYNOTE LECTURE 23: MEASUREMENTS OF BIOTRANSPORT PROPERTIES OF OCULAR TISSUE FOR DRUG DELIVERY MODELING

Satwindar Sadhal (University of Southern California, USA)

Thursday, August 06, 11:30–12:30, Room LOUVRE III + IV

Chair: Janusz Szmyd

Abstract

The biophysical properties of various ocular tissue are fundamentally important parameters for predictive modeling of ocular drug delivery. In this regard, since the vitreous humor has the largest volume of a single tissue in the eyeball, it has been the focus of attention of many researchers over the last several decades. While various measurement techniques have been developed, the accuracy of measurements in biological systems is always a challenge. Among the methods include imaging techniques (fluorescence and MRI) that consist of injecting a contrast agent or a labeled drug bolus into the vitreous and tracking the contours of its advancement in time. The 3-D MRI visualization provides a clear snapshot of the diffusion contours in the vitreous humor, and a combination of analytical and numerical solutions provides an accurate quantitative tool for the measurement of the diffusion coefficient. The measurement is set up as na inverse problem whereby a predictive model for the same initial conditions is matched with the experimental measurements while floating the diffusion coefficient value which is delivered through a least-squares best fit. This technique referred to as the 'contour method' has led to results for various molecules ranging in size from approximately 0.1 to 160 kDa. For excised bovine eyes with drug surrogates such as Gd-DTPA, Prohance, galbumin and immunoglobulin G, an accuracy of about 10% has been achieved while in the case of live rabbits using fluorescein labeled Bevacizumab, it is about 30%. In the case of real drugs, the success of this technique depends on the effective labeling of the drugs with suitable contrast agents such as fluorescein and gadolinium or manganese to facilitate fluorescence or MR imaging. As expected, the diffusion coefficient values for the different molecules show an inverse relationship with the molecular mass of the surrogate, with some effects due to the net charge on the molecule. Among other techniques, experimental investigations have been conducted with the use of a diffusion apparatus for measuring permeation of a drug across an excised vitreous body from a donor chamber to the receptor while sampling assays from the chambers at various time intervals. This method has the advantage of not requiring labeling but is otherwise more disruptive to the vitreous. The results from the various methods over the last 40 years have been catalogued and correlations for the diffusion coefficient as a function of molecular mass have been developed.

KEYNOTE LECTURE 24: INTEGRATED COUPLING ANALYSIS OF ELECTRIC POWER AND THERMAL ENERGY MANAGEMENT SYSTEMS IN HYBRID-ELECTRIC PROPULSION (HEP)

Haiwang Li (Beihang University, China)

Thursday, August 06, 11:30–12:30, Room SEGOVIA I + II

Chair: Stephan Kabelac

Abstract

With the adoption of megawatt-class electric machines, power conversion devices, and high-specific-energy batteries, thermal management has become a critical challenge in multi-electric aircraft propulsion systems, particularly represented by hybrid-electric systems. Simultaneously, the powertrain, electrical power system, and thermal management system form a deeply coupled and multi-scale interactive system encompassing power, electricity, and heat. Enabling cross-scale coupling analysis and efficient management of this multi-energy system (power-heat-electricity) is key to unlocking the potential of Hybrid Electric Propulsion (HEP). Current research on electrical and thermal management systems remains relatively independent, unable to address the multi-time-scale coordinated management required for multi-electric propulsion systems. Moreover, the overall design of propulsion systems lacks a systematic integration methodology with trade-offs. For the system evaluation, a deep-integration approach for power-electricity-heat in multi-electric aircraft propulsion is proposed. This approach, based on unified mass-energy-heat conservation equations, incorporates electric propulsion components, thermal management system components, and multiple heat sinks into a unified design space, establishing a performance evaluation model for HEP systems. For the dynamic thermal management, a dynamic modeling method for thermal management components based on equivalent control volumes and the fusion of reduced-order models is introduced. This enables dynamic simulation and real-time prediction of thermal pipe systems, resolving multi-system, cross-time-scale control challenges. For the collaborative optimization of multi-system, a dynamic co-optimization framework with a dual-level energy-thermal game architecture is constructed. This framework targets the three-dimensional coupling objectives of energy efficiency, thermal safety, and flight performance. The two layers engage in continuous gaming and control through dual variables representing energy consumption costs and temperature constraints. Overall, the above methods provide a practicable solution for next-generation engine energy-thermal collaborative management.

KEYNOTE LECTURE 25: INFRARED THERMAL IMAGING IN EXERCISE SCIENCE: APPLICATIONS, INSIGHTS, AND MODELING

Giovanni Tanda (Università degli Studi di Genova, Italy)

Thursday, August 06, 13:30–14:30, Room LOUVRE I + II

Chair: Atsuki Komiya

Abstract

Human body temperature comprises the temperatures of the core and skin. Core temperature, regulated by the hypothalamus, reflects the thermal state of deep body tissues and is typically maintained within a narrow range around 37°C. In contrast, skin temperature, affected by environmental conditions and peripheral blood flow, can vary significantly across body regions and during physical activity. Infrared thermography (IRT), widely used in engineering, is increasingly being applied in medical and sports sciences as a non-invasive method for assessing skin temperature. In sports and exercise science, IRT is employed to evaluate performance, monitor injury recovery, and detect vascular changes induced by exercise. Among various sports, such as cycling, swimming, and running, the last discipline is one of the most extensively studied for thermographic analysis, owing to its widespread practice and the physiological stress it imposes. As a result, analyzing skin temperature responses via IRT can provide indirect insight into an athlete's fitness level and thermoregulatory efficiency. Despite its potential, IRT lacks standardized methodologies, leading to variability in data acquisition and interpretation. This note highlights the following key challenges:

- Accurate skin temperature estimation: IRT provides a two-dimensional projection of a three-dimensional body, limiting analysis to exposed skin and complicating full-body temperature assessment. To address this, researchers typically define a finite number of Regions of Interest (ROIs) and compute mean skin temperature using weighted averages.
- Image acquisition under dynamic conditions: running involves continuous motion, which can degrade image quality through blurring and lead to partial visibility of body regions. The inaccessibility of certain skin areas further complicates consistent measurement.
- Standardization of experimental conditions: thermographic studies vary in exercise protocols (e.g., treadmill vs. track running) and environmental conditions (temperature, humidity, airflow, radiation exposure). Controlled, repeatable setups are essential for reliable data comparison.

- Interpretation of skin temperature variations: skin temperature changes observed via IRT during exercise are influenced by both intrinsic (e.g., metabolic heat production) and extrinsic (e.g., ambient temperature, humidity) factors. Integrating IRT data with simplified energy balance models can enhance understanding of thermoregulatory mechanisms.

In conclusion, while IRT shows great promise in sports science, particularly in studies of thermoregulation during running, methodological consistency and careful data interpretation are essential to fully realize its potential.

KEYNOTE LECTURE 26: THERMOCHEMICAL ENERGY STORAGE FOR THE HEAT TRANSITION: ADVANCING HEAT STORAGE AND UPGRADE SOLUTIONS

Mina Shahi (University of Twente, Netherlands)

Thursday, August 06, 13:30–14:30, Room LOUVRE III + IV

Chair: Bingyang Cao

Abstract

Thermal Energy Storage (TES), often referred to as a "heat battery", is a cornerstone technology for industrial decarbonization. It enables flexible use of renewable electricity for heat production, helps shift demand to off-peak hours, and facilitates recovery of industrial waste heat—an untapped resource equivalent to approximately 25% of Europe's residential heating demand. Among TES technologies, Thermochemical Energy Storage (TCES) stands out due to its superior energy density, minimal thermal losses, and potential for long-duration storage. TCES systems use reversible solid–gas reactions in thermochemical materials (TCMs), storing heat during endothermic reactions and releasing it during exothermic reactions, with temperature flexibility determined by reactor vapor pressure. Despite promising lab-scale performance, scaling TCES for industrial applications presents critical challenges. One key limitation is the decline in system efficiency over repeated charge–discharge cycles, often driven by the formation of preferential gas flow paths that reduce effective contact between the gas and solid phases. These changes result in slower reaction kinetics, impaired mass transfer, and decreased thermal output. This presentation will share recent findings on how these mechanisms affect long-term TCES performance, supported by experimental data and physical modeling. It will also explore potential strategies for mitigating these effects, ranging from material and reactor design improvements to operational optimization. Finally, future directions will be outlined, emphasizing the role of multi-scale modeling, and advanced characterization techniques in overcoming current limitations and accelerating the industrial deployment of TCES technologies.

KEYNOTE LECTURE 27: HEAT AND MASS TRANSFER CHARACTERISTICS OF COAXIAL ROUND JETS

René van Hout (Israel Institute of Technology, Israel)

Thursday, August 06, 13:30–14:30, Room SEGOVIA I + II

Chair: Bong Jae Lee

Abstract

Jet flows have been extensively studied because of their relevance in industrial processes such as high thermal load cooling and combustion, while also serving as canonical flow configurations for exploring fundamental heat transfer and mixing mechanisms. Among the various configurations, a coaxial round jet offers versality and enhanced performance over single jets. This keynote focuses on the near-field dynamics of isothermal coaxial round jets (two concentric, non-swirling jets of the same-density fluid) and their implications for heat and mass transfer. The talk starts with a brief overview of research on coaxial jets. Redistribution of the total mass flow by adjusting the velocity ratio between the outer and inner jets (ru=Uo/Ui), significantly affects the development of shear and wake instabilities, which govern the formation of coherent vortices. By fine-tuning ru, these instabilities can be manipulated to optimize transport characteristics at a given mass flow rate. Recent particle image velocimetry (PIV) results will be presented to illustrate how varying ru alters the near-field vortex structure and flow topology. Two studies are discussed: (i) on convective heat transfer characteristics of pulsating impinging coaxial jet flows, and (ii) on fiber dispersion in steady coaxial jet flows. In the first study, an in-house designed ultra-thin (400nm), Joule heated surface enabled the measurement of temporally and spa ally changing temperature fields up to pulsation frequencies of 200Hz using high-speed thermography. Results indicated that steady, non-pulsating coaxial jet operation yielded the highest overall heat transfer at ru=2. Further enhancement of the heat transfer coefficient was achieved across all ru by applying pulsation within a narrow frequency band to the weaker of the two coaxial jets. The second study examined the translational and rotational motion of non-spherical, nylon fibers (1.5 mm) exiting from the inner jet and interacting with the inner shear layer in the near-field of the coaxial jet. By changing ru, the inertial response of the fibers is modified and by resolving both the instantaneous flow field and fiber trajectories, instantaneous translational and rotational slip velocities were measured allowing for a detailed analysis of single fiber interaction with the near-field coherent vortices. This keynote concludes with a discussion of future research directions and challenges in leveraging coaxial jet dynamics for thermal and mass transport.

KEYNOTE LECTURE 28: ELECTRIFYING DISTILLATION PROCESSES THROUGH MECHANICAL VAPOR RECOMPRESSION: FROM POTENTIAL ANALYSIS TO CONCEPTIONAL EQUIPMENT DESIGN

Stephan Scholl (Technical University of Braunschweig, Germany)

Thursday, August 06, 14:30–15:30, Room LOUVRE I + II

Chair: Renato Cotta

Abstract

Thermal separation operations, like evaporation, distillation, rectification, drying or ab- and desorption, in downstream processing stand for roughly 3 % of the global primary energy demand as well as the associated CO 2 -emissions (Jana, 2014; Kiss, 2014). Heat integration technologies, such as the Pinch Technology, have allowed to reduce external energy demand through the match of process internal heat sinks and heat sources (Linnhoff, 1993). On its way to further reduce direct and indirect carbon emissions, the process industry relies on an increased use of renewable electrical energy in its production processes. Closed loop as well as open loop heat pump systems allow to upgrade thermal energy to a higher supply level such that it may serve as valuable heat source. In the processing of aqueous systems, such as seawater desalination or the concentration of aqueous extracts, mechanical vapor recompression (MVR) has proven its ability to satisfy thermal energy demand by utilizing electrical energy. However, MVR technology has not yet found broad application for typical, frequently non-aqueous component systems in the process industries. This contribution presents a comprehensive approach to promote the use of MVR technology in the context of chemical production processes. The work focuses on distillation and rectification processes as these represent roughly half of the thermal energy demand in typical thermal downstream separations. The identification of favorable process constellations, the quantification of the CO 2 -reduction potential and the conceptual process and equipment design are key steps in the assessment of the technical feasibility, economic profitability and ecological beneficiality of an MVR solution. Based on generic process constellations with close- and wide-boiling component systems, a typical workflow has been elaborated for the conceptual equipment design of compressor and heat exchanger combinations supporting the evaluation of MVR assisted distillation systems. The approach integrates a preliminary potential analysis, vapor recompression as well as heat transfer technology to identify technically feasible measures for further ecological and economic assessment. The presentation will elaborate on the approach, present typical results and give an outlook on potential next steps.

Literature

A. K. Jana, Energy Conv. Manage. 2014, 77, 287–297, DOI: 10.1016/j.enconman.2013.09.055.

A. A. Kiss, J. Chem. Tech. Biotech. 2014, 89, 479–498, DOI: 10.1002/jctb.4262.

B. Linnhoff, Trans. Inst. Chem. Eng. 1993, 71(A), 503-522.

KEYNOTE LECTURE 29: MEASUREMENT AND IMPROVEMENT OF AIR-SIDE AND REFRIGERANT-SIDE HEAT TRANSFER IN HIGH-PERFORMANCE HEAT EXCHANGERS

Stefan Elbel (Technical University of Berlin, Germany)

Thursday, August 06, 14:30–15:30, Room LOUVRE III + IV

Chair: Jat du Toit

Abstract

By utilizing the analogy between heat and mass transfer, local air-side heat transfer coefficients (HTCs) can be measured with a sorption-based technique in which a tracer gas reacts with a special thin film coating applied to the heat transfer surface of interest. The resulting color change is recorded visually and linked to the local mass transfer. The accuracy of this sorption-based experimental method has been validated on external flow across a flat plate which shows good agreement compared to the analytical solution. With this method, it is now possible to accurately quantify local HTCs of real-scale heat exchanger fins. The averaged HTCs and pressure drops of the three fin-and-tube arrays in the current study agree well with data from other researchers who have measured entire heat exchangers with similar fin geometries. In addition, the degradation of the HTCs with increasing row numbers of the three fin types has been quantified. It can be utilized to generate better HTC correlations for heat exchangers and to recognize opportunities for improvement. Experimental results are also compared to CFD results to assess where good agreement can been reached and for which geometries the CFD results deviate to a larger degree. Additional findings from a recent study to design an alternative coating formulation are also presented. Potential future research directions for air-side investigations include cases with dehumidification and frosting. Potential tube-side applications to quantify local refrigerant-side HTCs are also discussed. In the second part of the paper, improvements of heat transfer on the refrigerant-side of heat exchangers are discussed with an emphasis on reducing refrigerant dry-out effects. In one example, the performance degrading effects of two-phase flow mal-distribution are reduced by utilizing an overfeed system that is powered by expansion work recovered by an ejector. The experiments were conducted with ammonia, but the improvements can be achieved with other fluids as well, as the mechanism effectively eliminates refrigerant dry-out without requiring additional external power input. In another study using CO2, it was found that higher oil circulation rates cause a flow regime transition in which foaming flow was able to reliable wet the top surface of a horizontal 7.9mm round tube. While pressure drop increased as expected, the resulting heat transfer improvements were substantial compared to the cases with low or no oil circulation.

KEYNOTE LECTURE 30: UNVEILING NEW INSIGHTS INTO INTERFACIAL PHENOMENA WITH SURFACE PLASMON RESONANCE IMAGING

Seong Hyuk Lee (Chung-Ang University, Korea)

Thursday, August 06, 14:30–15:30, Room SEGOVIA I + II

Chair: Leonid Dombrovsky

Abstract

This presentation briefly introduces Surface Plasmon Resonance imaging (SPRi), a near-field, label-free technique that can resolve nanometric thin-film dynamics in real time. By leveraging the vertical sensitivity of surface plasmon polaritons in the Kretschmann configuration, SPRi enables direct, thickness-resolved visualization of interfacial transport processes at nanometer-scale resolution. Applications to dropwise condensation, binary-mixture droplet evaporation, and evaporating thin films are presented. Interestingly, SPRi reveals the persistence of ultra-thin liquid films near the contact line during the pinned stage of evaporation, despite macroscopic changes in droplet geometry. The combined experimental and theoretical analyses demonstrate that local-equilibrium, kinetic-limited physics governs the thin-film region, in contrast to diffusion-limited transport in the bulk liquid. These findings offer new physical insight into nanoscale interfacial transport and highlight SPR imaging as a powerful tool for advancing phase-change control in thermal management and surface engineering.

REGULAR PRESENTATIONS

Presentations of regular papers will be performed in a joint oral and poster format. The oral and poster presentations will be performed in the same conference room, specified below.

During the first part of the technical session, each presenter will have two minutes to briefly describe the contents and results of the paper. Audio-visual equipment will be available for this two-minute presentation, which will not include questions from the audience. Authors are asked to strictly adhere to the limit of two minutes per paper.

After the oral presentations of all papers are finished, authors are asked to stay in front of their posters until the end of the technical session, for interactions with other participants.

Authors need to upload the files with their two-minute presentations on the day before the assigned technical session. The file must be uploaded to the media desk available in the corresponding conference room.

The two-minute presentation will follow the same paper order specified in the technical session, which can be found below. Also, each poster should be hung on the board with the same number as the paper presentation order.

POSTER 1 — MICRO AND NANOSCALE PROCESSES + MULTIPHYSICS PROBLEMS

2026-08-04 08:00–10:00 Alhambra I | Chair: Ofodike Ezekoye

No.	Code	Title	Authors (presenter in bold)
1	IHTC18-0059	Exploiting nanocomfinement of reticular materials for anti-icing	Simrandeep Bahal, **Jianhui Zhang**, Vikramjeet Singh, Manish Tiwari
2	IHTC18-0071	Microscopic Mechanism of CO2 Transport in MOF-based Mixed Matrix Membrane	**Zhuo LI**, Xiaohui Liu, Zixuan Yu, Wenquan Tao
3	IHTC18-0077	Effects of Connection Structure on Thermal and Electrical Properties of Nanowire Networks	**Kazuya Tatsumi**, Yuki Wakamatsu, Bowen Gu, Reiko KURIYAMA
4	IHTC18-0179	Electric-field-responsive covalent organic frameworks with dipolar rotors: Studies on the energies of the frameworks and temperature-induced activation of rotor motions	**Xiaohan Wang**, Syunto Goto, Takejiro Ogawa, Takuya Miyazaki, Kouki Kawamura, Atsuko Kosaka, Hiroaki Suzuki, Wang Zhang, Kiyohiro Adachi, Daisuke Hashizume, Hidehiro Uekusa, Masaki Kawano, Ryosuke Takehara, Yoshiaki Shoji, Takanori Fukushima, Yoichi Murakami
5	IHTC18-0194	Numerical investigation of heat transfer in a honeycomb rotary kiln	**Jannes Hahne**, Claudia Meitzner, Andreas Bück, Fabian Herz
6	IHTC18-0249	Experimental Study of Surface Charging Near Three–Phase Contact Lines	**Yuki Ishihara**, Hideaki Teshima, Qin–Yi Li, Koji Takahashi
7	IHTC18-0405	Linking Nanotexture to Macroscopic Wetting: Alignment-Dependent Precursor-Film Propagation on Cellulose Nanofiber Surfaces	**Masumi Misaka**, Hideaki Teshima, Qin-Yi Li, Koji Takahashi
8	IHTC18-0408	Non-Contact Measurement of Thermal Diffusivity in Micro-Scale Materials under Ambient Conditions using a Heat-Loss Modified Ångström's Method	**Marcos Vinicius Cerri Silva**, Takumi Pascal Shimizu, Atsuki Okada, Katsuaki Hashikuni, Kazuyuki Matsuhira, Koji Miyazaki
9	IHTC18-0424	Fundamental Study on Object Shape Measurement Method using Laser Light and Ultrasound Waves	Weichen Zhang, **Hiroshige Kikura**, Naruki Shoji, Hideki Kawai, Nobuyoshi Tsuzuki
10	IHTC18-0491	Molecular dynamics study of the effect of nanostructure morphology on solid-liquid interfacial thermal resistances	**Ryohei Abo**, Kunio Fujiwara, Masahiko Shibahara
11	IHTC18-0556	A Molecular Dynamics Study on Local Liquid Diffusion Coefficient Distribution in a Nano-channel Coated with Graphene	**Ryota Yamaji**, Shota Uchida, Kunio Fujiwara, Masahiko Shibahara
12	IHTC18-0568	Wettability Independence of Slip Length Revealed Using FM-AFM	**Haruya Ishida**, Hideaki Teshima, Qin-Yi Li, Koji Takahashi
13	IHTC18-0604	Effect of Silica Surface Roughness on Wettability: A Molecular Dynamics Study	**Taichi Takashima**, Shota Uchida, Kunio Fujiwara, Masahiko Shibahara
14	IHTC18-0614	SPECTRAL AND ANGULAR CHARACTERIZATION OF PDMS THERMO-OPTICAL COEFFICIENTS: A FOUNDATION FOR 3D TEMPERATURE MAPPING IN MICROFLUIDIC	**Jordan Letessier**, Jérémie Maire, Stéphane Chevalier
15	IHTC18-0635	EXPERIMENTAL AND CFD-BASED ANALYSIS OF EVAPORATION AND CRYSTALLIZATION OF UREA-WATER SOLUTION DROPLETS	**Lorenzo Vianello**, Alexandra Tamara Hintz, Axel Sielaff, Peter Stephan, Tatiana Gambaryan-Roisman
16	IHTC18-0677	Solvent dependence of a non-Newtonian quasi-2D wax deposition model coupled with compositional thermodynamics	**Samuel Candido**, Luis Fernando Alzuguir Azevedo, Angela Nieckele, Guilherme Vieira Lima, Annie Fidel-Dufour
17	IHTC18-0688	INFLUENCE OF MASS DIFFUSION ON THE WAX DEPOSITION PROCESS	**ivan fernney ibanez aguilar**, Paulo Gustavo Candido De Oliveira, Guilherme Vieira Lima, Angela Nieckele, Luis Fernando Alzuguir Azevedo
18	IHTC18-0740	Supercritical CO_2 behavior in offshore CCUS injection wells: implications for casing design and structural integrity.	**Anderson Rapello dos Santos**, Antônio Carlos Ramos Júnior, Rafael de Castro Oliveira, Nelson Moreira Júnior, Felipe de Souza Terra, Charlton Okama Souza, Ingrid Ezechiello da Silva, Jorel Lopes R. dos Anjos, Carine de Menezes Rebello, Erbet Almeida Costa, Idelfonso B.D.R. Nogueira, Cédric Guyon, Frédéric Rousseau, Florian Alain Yannick Pradelle
19	IHTC18-0834	Three-dimensional microfluidic device for efficient nanoparticle concentration and extraction under alternating-current electric field	**Shogo kataoka**, Naoya Sugita, Yoshiyasu Ichikawa, Masahiro Motosuke
20	IHTC18-0835	Thermally driven nanoparticle accumulation by coupling AC electric field and plasmonic bubble convection	**Takuma Ohata**, Reo Sudo, Shuto Isobe, Yoshiyasu Ichikawa, Masahiro Motosuke
21	IHTC18-0899	Thermal Behavior of a Hydrogen Plasma–Based Helical MHD Generator	**Haram Oh**

22	IHTC18-0956	Dynamic Performance of CO_2-Based Two-Phase Closed Thermosyphons Under Realistic Transient Boundary Conditions	**Muhammad Saad Khan Tareen**, Mohammad Zolfagharroshan, Kim Leong Liaw, Sohail Akhtar, Messaoud Badache, Agus P. Sasmito
23	IHTC18-1034	NUMERICAL ANALYSIS OF FULLY DEVELOPED FLOW AND HEAT TRANSFER IN A PARALLEL-PLATE MICROCHANNEL WITH RANDOMLY GENERATED SURFACE ROUGHNESS	**Miguel Penna Ramos**, Leandro Alcoforado Sphaier, Isabela Florindo Pinheiro, Michele Celli, Antonio Barletta, Pedro Vayssiere Brandão
24	IHTC18-1102	Evaluation of nanoscale interfacial structure and interaction on surface-modified Ag/component of epoxy resin interface by molecular dynamics approach	**Yoichiro Kurosawa**, Takamasa Saito, Yohei Okada, Manabu Inutsuka, Chiharu Tokoro, Eita Shoji, Momoji Kubo, Masaki Kubo
25	IHTC18-1163	Unveiling the effects of temperature-humidity aging on thermodynamic of PDMS-based thermal interface materials via molecular dynamics	**Muxing Zhang**, Kaile Li, YANLING ZHANG, Xuemei Chen, Qiang Li
26	IHTC18-1183	Preliminary studies on the use bubbling process to prevent sedimentation of nanoparticles from nano-enhanced phase change materials	**Paulina Rolka**, Tomasz Przybylinski, Roman Kwidzinski, Marcin Lackowski
27	IHTC18-0922	Experimental and Computational Analysis of a Carbon Dioxide–Charged Thermosyphon for Artificial Ground Freezing	**Kim Leong Liaw**, Mohammad Zolfagharroshan, Muhammad Saad Khan Tareen, Sohail Akhtar, Agus P. Sasmito
28	IHTC18-0383	Tuning phonon transmission and thermal resistance through rough structures at AlN/Ga interface	**Jiaqing Zhang**, Wenxiao Chu, Qiuwang Wang

POSTER 2 — ENERGY CONVERSION AND STORAGE + HEAT EXCHANGERS (A)

2026-08-04 08:00–10:00 Alhambra II | Chair: Christos Markides

No.	Code	Title	Authors (presenter in bold)
1	IHTC18-0048	Micro-explosion of water-fuel droplets: enhancement of heat and mass transfer in combustion chambers	**Pavel Strizhak**, Roman Fedorenko, Vladlena Chobotova
2	IHTC18-0151	Experimental and numerical study of a versatile thermal energy storage module for urban heat and cold networks	**Thomas TERRIEN**, Bruch, Bentivoglio, Stutz, Sy
3	IHTC18-0153	Local entropy production in a composite using calcium hydroxide and silicon carbide-based foam support for thermochemical energy storage	**Shigehiko Funayama**, Tsuyoshi Izaki, Hana Saeki, Takashi Kato, Hiroki Takasu, Yukitaka Kato
4	IHTC18-0163	Multi-condition topology optimization of fin structures for enhanced performance in latent heat storage units	Shenglei Xia, Yao Zhao, Yun Xie, Qi Deng, **Christos Markides**
5	IHTC18-0263	Efficient Dual-Ion Thermal Charging Cell for Self-Sustaining Low-Grade Waste Heat Recovery	**Cheng CHI**, Chen Shen, Hongwei WU, Xiaoze DU
6	IHTC18-0315	Heat Transfer Enhancement during PCM Solidification in a Stationary Cold Thermal Energy Storage System with Bionic Tree-Shaped Fins	Lucong Han, **Yuying Yan**
7	IHTC18-0448	Effect of heat pipe failure on temperature distribution and effectiveness of a PCHE used in a sCO2 Brayton cycle applied to microreactors	Curtis H. Foster, **Tiago Augusto Moreira**, Gregory F. Nellis, Mark H. Anderson
8	IHTC18-0458	Redox-Induced Changes in Charge and Mass Transport in Solid Oxide Cell Fuel Electrode	**Anna SCIAZKO**, Takaaki Shimura, Yosuke Komatsu, Naoki Shikazono
9	IHTC18-0502	Dynamic Modeling of Ammonia-Based Thermochemical Heat Transformers	**Chung Yu Yeh**, Alvaro Martínez, Harshita Gupta, Shirin Dehgahi, Davoud Jafari, Jimmy Faria Albanese, Abhishek Kumar Singh
10	IHTC18-0540	Refrigerant based cold thermal energy storage for solar driven vapour absorption refrigeration systems	**Sarath Babu Kaki**, Zahra Hajabdollahi Ouderji, Zhibin Yu
11	IHTC18-0616	Internal Irreversibilities Impact on the Optimal Operating Conditions of Carnot Batteries	**Sullivan Durand**, Pierre Neveu, Didier Haillot, Daniel Rousse
12	IHTC18-0657	An efficient heat exchanger networks synthesis algorithm via binary-variable-free graph representation and benders decomposition	**Run-hang Teng**, Tian Zhao, Qing-han Sun, Qun Chen
13	IHTC18-0665	Characterization of Salt Melting in a Helical Finned Heat Storage Unit	Maoz Yakobi, **Gennady Ziskind**
14	IHTC18-0681	Techno-Economic Assessment of a Carnot Battery in a Northern Mining Context	**Sullivan Durand**, Pierre Neveu, Didier Haillot, Daniel Rousse
15	IHTC18-0773	TRANSFORMING DATA CENTER WASTE HEAT: A FEASIBILITY ASSESSMENT OF THERMOCHEMICAL HEAT TRANSFORMERS	**Alvaro Martínez**, Chung-Yu Yeh, Harshita Gupta, Shirin Dehgahi, Jimmy Faria Albanese, Davoud Jafari, Abhishek Kumar Singh
16	IHTC18-0787	Temperature distribution in PEM water electrolysis short stacks	**Dingding Ye**, Yuxiang Zhou, Jun Li, Liang Zhang, Jian Huang, Yang Yang, Xun Zhu, Qiang Liao
17	IHTC18-0854	Recovering and Upgrading Waste Heat from Industrial Sectors via Thermochemical Heat Transformer System	**Ramin Roushenas**, Marco Ballatore, Artem Sybir, Aldo Cosquillo, Marc Linder, Abhishek K. Singh
18	IHTC18-0939	MULTIPHYSICS MODELING OF A MOVING BED REACTOR FOR Ca(OH)2/CaO THERMOCHEMICAL ENERGY STORAGE SYSTEM	**Khushwant Singh Chauhan**, Mohammad Mehrali, Serhii Fedorov, Artem Sybir, Matthias Schmidt, Marc Linder, Davoud Jafari, Abhishek Kumar Singh
19	IHTC18-0961	Cold Production Using Coaxial Metal Hydride–Air Heat Exchangers: Modeling and Design Guidelines	Aya Loubirat, **Maha Bhouri**
20	IHTC18-1072	Heat-Transfer Limits and Isotherm Effects Governing Power Density and Energy Density in Sorbent-Based Thermal Energy Storage	Ibrahim Halil Sahin, **Bachir El Fil**
21	IHTC18-1088	Performance Evaluation of a Thermal Management System for Hybrid Electric Vehicles	**Youn Cheol PARK**, Eui Jeon Jeong, Gwang Soo Ko, Jeong Kwon Park, Yuman Won, Hyo Chan Bae
22	IHTC18-1090	Experimental Study on Ice-Free and Efficient Cold Start-up of PEMFC with Metal Foam Flow Field	**Ke Xue**, Pu He, Chongyang Huang, Zhuo Zhang, Binxin Qiao, Wenquan Tao
23	IHTC18-1094	PERFORMANCE ANALYSIS OF A 4 KWH BENCH SCALE PACKED-BED LATENT HEAT STORAGE UNIT WITH AL-SI BASED PCM PELLETS	**Tomokazu Nakamura**, Yusuke Sato, Yuto Shimizu, Cholila Tamzysi, Melbert Jeem, Lianying shan, Justin Ningwei Chiu, Shoma Fujii, Ade Kurniawan, Takahiro Nomura
24	IHTC18-1175	An electric-opto combined measurement method for identifying filled traps in the HEMTs with high spatial resolution	**Fengyi Li**, Aoran Fan, Xing Zhang, Huaqing Xie

25	IHTC18-1177	Investigation on Localized Thermal Response Modeling in Scanning Thermal Microscopy Based on Deep Neural Network	**Yifan Li**, Fengyi Li, Wei Yu, Huaqing Xie, Jiang Wu
26	IHTC18-1184	Temperature Distribution and Heat Transfer in a Storage Tank Containing Microencapsulated Phase Change Slurry Using Fiber Bragg Grating	**Alekos Ioannis Garivalis**, Yuri Scardigli, Dario Groppi, Carlo Bartoli, Daniele Testi
27	IHTC18-0178	Thermal analysis of a power-to-heat-to-power system using repurposed oil wells for energy storage	Younghyun Ko, **Jader Barbosa**
28	IHTC18-0346	Numerical Simulation analysis of influence of frontal air velocity on resistance performance of indirect cooling tower with vertical heat exchanger	**lilujun**, zhuqing, songxiaojun
29	IHTC18-0349	STUDY ON WATER-SAVING CHARACTERISTICS OF THE AIR-COOLED CONDENSER USED FOR NATURAL DRAFT WET COOLING TOWERS	**Cen Yang**, Wenhui HUANG, Xiaojun SONG, Yi LIU, Lujun LI, Zhiyong SONG, Chunhua HUANG
30	IHTC18-0442	PDE-Based Redefinition of Merkel Number for Improved Fill Modeling in Wet Cooling Towers	**Li JiaCun**, Yi He, Xuan Zhang, Nan Zhang, Du XiaoZe, Wei HuiMin
31	IHTC18-0342	Numerical simulation of the impact of windbreak walls on 2×660 MW direct air cooling power generation units	**HUANG Wenhui**, YANG Cen, LIU Yi, SONG Xiaojun, LI Lujun, SONG Zhiyong, HUANG Chunhua
32	IHTC18-0312	Crosslinking and Salt Chemistry as Design Levers for Hydrogel Sorbents in Dehumidification and Atmospheric Water Harvesting	**Joseph Mooney**, Avery Skolnick, Bachir El Fil

POSTER 3 — CONVECTION (A)

2026-08-04 08:00–10:00 El Pardo II | Chair: Tunde Bello-Ochende

No.	Code	Title	Authors (presenter in bold)
1	IHTC18-0189	Numerical investigation of wall channeling effect and bypass flow in a randomly packed pebble bed using real geometry	Chenzheng Yan, Xiaoyang Xie, **Xiaowei Li**, Li Shi, Libin Sun, Xinxin Wu
2	IHTC18-0199	Convection in internally heated dielectric fluid layer under microgravity conditions	Kushal Nagaraj, **Peter**, Christoph Egbers
3	IHTC18-0319	DIRECT NUMERICAL SIMULATION OF TURBULENT MIXED CONVECTION IN VERTICAL AND INCLINED PIPE	Sarit Kumar Das, Kameswararao Anupindi, **MADHURJYA MAHANTA**
4	IHTC18-0396	Impact of Ambient Wind on the Thermal Performance of Counterflow Natural Draft Cooling Tower	**Songzhiyong**, Huang chunhua, HUANG Wenhui, Wang Yushi, Gong Fuhao, Wang Yinuo
5	IHTC18-0430	Uncertainty Analysis of Heat Transfer, Pressure Drop and Flow Distribution of an Offset-Strip-Fin Heat Exchanger	**Lauris Richter**, Constantin Rachow, Jan Stegmann, Jonas Hesse, Xing Luo, Stephan Kabelac
6	IHTC18-0444	Direct Numerical Simulation of Turbulent Convection Heat Transfer in Helically Coiled Tubes	**Xie Xiaoyang**, Yuntong Cai, Zhao Houjian, Li Xiaowei, Wu Xinxin
7	IHTC18-0544	Experimental investigation of laminar heat transfer and pressure drop in roughened minichannels at low Reynolds numbers	**Saija Schaefer**, Yan Jin, Arne Speerforck, Andrea Luke
8	IHTC18-0598	Study and Validation of a Tunnel Pasteurizer for Tomato–based Products	SARA RAINIERI, Luca Pagliarini, **Umberto Neviani**, Matteo Squeri
9	IHTC18-0644	THERMAL HYDRAULIC CHARACTERIZATION OF A METAL ADDITIVELY MANUFACTURED TRIPLY PERIODIC MINIMAL SURFACE BASED HEAT EXCHANGER	Arpita Das, Brian O'Malley, James Tancabel, Cheng-Yi Lee, Jan Muehlbauer, **Vikrant Aute**
10	IHTC18-0679	IMPACT OF NATURAL CONVECTION ON SHEAR STRESS DURING OIL PIPELINE SHUTDOWN OPERATIONS	BRUNO Nieckele Azevedo, **Angela Nieckele**, ivan fernney ibanez aguilar, Leonardo Soares Fernandes, Marcelo de Albuquerque Lima Gonçalvez, Osvaldo Karnitz Junior, Rogerio Leite Alves Pinto
11	IHTC18-0767	Evaluation of winglets efficiency in a tube bundle with plain fins under free and mixed convection	**Marina Zasimova**, Vladimir Ris, Alexander Levchenya, Alexey Abramov
12	IHTC18-0839	Adjoint-based shape optimization of turbulators in spatially developing boundary layers	**Yukinori KAMETANI**
13	IHTC18-0861	EVALUATION OF HEAT TRANSFER COEFFICIENT CORRELATIONS FOR SUPERCRITICAL CARBON DIOXIDE	**Victor Gouveia Ferrares**, Mateus Henrique Corrêa, Cristiano Tibiriçá
14	IHTC18-0891	Performance enhancement of solar air heaters using passive flow controllers: Experimental study with louvered sheets	**Mohannad Khair**, Aben Binu, Rodrigo Pinto, Wallace Ferreira, Daniel Dezan, Antônio Gallego, Rafael Duarte, Tamy Guimarães
15	IHTC18-0892	Numerical and Experimental Analysis of Heat Transfer in an Annular Minichannel Using STAR-CCM+	**Magdalena Piasecka**, Norbert Dadas, Beata Maciejewska, Artur Piasecki
16	IHTC18-0995	DIRECT NUMERICAL SIMULATION AND TURBULENT PRANDTL NUMBER MODEL OF HELIUM-XENON GAS MIXTURE IN A PLANAR CHANNEL	**Shunqi Wang**, Yu Ji, Jun Sun, Yuliang Sun
17	IHTC18-1040	Heat Transfer Enhancement Using Pin-Fins with Guide Structures in Gas Turbine Vane Trailing Edge Cooling	Gyeongryun Kim, Jaehyeong Kim, Hee Jae Lee, Yunchang Jang, **Hyung Hee Cho**
18	IHTC18-0030	Experimental investigation of mixed convective effects in a tube for a low Prandtl number fluid	**Linda Elmlinger**, Benjamin Dietrich, Thomas Wetzel
19	IHTC18-0034	Influence of the Strut Cross-Sectional Geometry of Periodic Open Cellular Structures (POCS) on Convective Heat Transfer	**Katharina Keller**, Thomas Wetzel, Benjamin Dietrich
20	IHTC18-0410	Effect of the annulus orientation on the dielectrophoretic force induced convection.	**Mohammed Hussein Hamede**, Yaraslau Sliavin, Vasyl Motuz, Christoph Egbers
21	IHTC18-0453	SENSITIVITY ANALYSIS OF GEOMETRIC PARAMETERS OF AN ULTRACOMPACT PRINTED CIRCUIT HEAT EXCHANGER FOR SUPERCRITICAL CO2	Bruno Henrique de Camargo Moreno, Jurandir Itizo Yanagihara, **Leandro Salviano**
22	IHTC18-0495	Ambient Air Humidity Level Contribution to Natural Convection in a Vertical Channel	**John Njoroge**, Puzhen Gao, Anselim M. Mwaura, Ala. A, Ayodeji, Qiao Shouxu, Muhammad Ilyas
23	IHTC18-0693	STUDY OF A VAPOR-LIQUID ADJUSTMENT EVAPORATOR WITH ZEOTROPIC MIXTURE BY USING COUPLED SIMULATIONS	**Jianyong Chen**, Xiaobin Zheng, Ying Chen, Xianglong Luo, Yingzong Liang, Jiacheng He
24	IHTC18-0771	Effect of a system of fluidic oscillators on the air mixing characteristics: a numerical study	**Nikolay Ivanov**, Vladimir Ris, Evgueni Smirnov, Marina Zasimova
25	IHTC18-0805	Study on response compensation method considering time constant change of fluid-temprature-field scanner	**Tomoya Houra**, Hiroyuki Kuru, Hirofumi Hattori

26	IHTC18-1075	Numerical Modeling Of Magnetocaloric Gadolinium Particle Flow: Magnetization Nonlinearity On Second-Law Performance	**Haonan Chen**, Hosei Nagano
27	IHTC18-1180	Numerical development of a heat transfer correlation for single-phase expansion in reciprocating expanders	**Reza Alijani**, Steven Lecompte, Xander van Heule, Wim Beyne
28	IHTC18-1085	Ultimate heat transfer with vibration-influenced convective turbulence at supercritical pressure	Zeng Kecheng, **YULI CAO**, Ruina Xu, Chonghao Yuan, Jiang Peixue
29	IHTC18-0988	Effect of Attack Angle in Delta-Winglet Vortex Generators on Ultracompact Heat Exchangers Operating with Supercritical CO_2	Laís Bandini, **Leandro Salviano**
30	IHTC18-0493	Investigation of a swirling annular impinging jet heat transfer under different flow regimes	**Mikhail Vitalievich Philippov**, Terekhov Viktor Ivanovish, Terekhov Vladimir Victorovich, Chokhar Igor Aleksandrovich, Nazarov Nikita Andreevich

POSTER 4 — APPLICATIONS: COMBUSTION AND FIRE MODELLING + COOLING OF ELECTRONIC EQUIPMENT

2026-08-04 16:00–18:00 Alhambra I | Chair: Manish Tiwari

No.	Code	Title	Authors (presenter in bold)
1	IHTC18-0039	Experimental Investigation on the Characteristics of a Hydrogen Flame Due to a Small Leak	**Yogesh Jaluria**, John Kurtanidze, Dhaval Dadia, Richard Hill, Francisco Javier Diez
2	IHTC18-0316	Large-Eddy Simulation of the flame-wall interaction with an inert metallic plate	**Adrien GRENOUILLOUX**, Kevin Bioche, Roxane Letournel, Nicolas Dellinger, Yacine Bechane, Vincent Moureau
3	IHTC18-0575	RADIATIVE HEAT TRANSFER IN CH4/H2 FLAMES: COMPOSITION AND REYNOLDS NUMBER EFFECTS WITH RAYLEIGH THERMOMETRY VALIDATION	Hamid Shafiee, Alexandre Gamboa, **Pedro Coelho**, Edgar Caetano Fernandes
4	IHTC18-0660	Direct numerical simulation study of wall heat transfer characteristics in turbulent channel flows with flame-wall interaction	**Ye Wang**, Mamoru Tanahashi
5	IHTC18-0710	Improving Heat Flux Measurements in Fires: Convection-Corrected Directional Flame Thermometer	**Ofodike EZEKOYE**, Emily Ash, Juliette Franqueville
6	IHTC18-0885	Analyzing 3D fields of emissions, refractive index and flame curvature in turbulent premixed stratified flames via tomographic imaging using multi-simultaneous measurements (TIMes)	**Fabio Martins**, Cheau Tyan Foo, Andreas Unterberger, Khadijeh Mohri
7	IHTC18-0938	Derivation And Comparison Between Coupled And Two-Region Models For Single Droplet Combustion	**Joao Vinicius Hennings de Lara**, Johannes Mich, Christian Hasse, Fernando Luiz Sacomano Filho
8	IHTC18-0117	Thermal performance comparison of annular enclosure geometries for subsea power electronics	**Lucas Militão**, Marcelo Lobo Heldwein, Jader Barbosa
9	IHTC18-0385	HIGH THERMAL CONDUCTIVITY HYDROGELS FOR FLEXIBLE ELECTRONICS: AN EQUIVALENT THERMAL RESISTANCE STUDY	**Dichu Xu**, Kuan Zhao, Jin Zhao, Dongsheng Wen
10	IHTC18-0414	Experimental and Numerical Study of Heat Transfer Performance of Jet Impingement Arrays	**Zhen Cao**, Zongguo Xue, Christos Markides
11	IHTC18-0422	Coupling Mechanism of Fluid-Thermal-Magnetic Fields for Heat Transfer Enhancement in Particle-Laden Channel Flow	**Wei Chen**, Zhaoguang Wang
12	IHTC18-0449	Multi-objective optimization of a surface-structured liquid-cooled channel under pulsating flow	**YINGTING TANG**, Zhaoguang Wang
13	IHTC18-0504	Design and analysis of multi-inlet cold plates based on the Constructal law	**José Félix Guil-Pedrosa**, Luis Miguel García-Gutiérrez, Antonio Soria-Verdugo, Sylvie Lorente
14	IHTC18-0509	Experimental Study on Direct Battery Cooling using Dielectrics and Flow Guiders	Lander Cnudde, Jana Rogiers, Jasper Nonneman, Michel De Paepe, **Guilherme Fornazari Ward Cruz**
15	IHTC18-0514	NUMERICAL INVESTIGATION OF HEAT DISSIPATION AND EXTERNAL COOLING CHARACTERISTICS IN SELF-VENTILATED INDUCTION MOTORS	Han Sol Yoo, Sungjin Yang, Yongwoo Shin, **Jongrak Choi**
16	IHTC18-0516	EFFECT OF FAN COVER GEOMETRY ON COOLING EFFECTIVENESS AND EFFICIENCY OF AN 11KW INDUCTION MOTOR	Juho Kim, Jin-seok Kim, Yongwoo Shin, Jongrak Choi, **Sungjin Yang**
17	IHTC18-0573	CFD-Based Entropy Generation Optimization of a Triply Periodic Minimal Surface Heat Exchanger	**Caio Quaresma de Freitas**, Ricardo Gandolfi, Guilherme Borges Ribeiro
18	IHTC18-0584	Flow boiling heat transfer in mini-channel heat sinks fabricated by wire-arc thermal spray	**Mohammad Hosseinzadeh**, Joshua Palumbo, Sanjeev Chandra
19	IHTC18-0808	Manifold microchannels for electrode thermal management in PEMFC: a parameter study	**Theodorus Hendriks Maria van der Laan**, Tinting Zhu, Canan Acar, Wilko Rohlfs
20	IHTC18-0857	Experimental Investigation of Heat Transfer Performance in Symmetric Channels with Sudden Expansion by Pulsating Flow	**DAIKI KOBAYASHI**, Takashi Fukue
21	IHTC18-0935	Experimental Study of Single- and Multi-Sled Two-phase Loop Thermosyphons for High-Power Server Cooling	**Manohar Bongarala**, Syed Faisal, Rishav Roy, David J. Apigo, Sarwesh N. Parbat, Yang Liu, Todd Salamon, Mark P. Earnshaw
22	IHTC18-1010	Evaluation of PCM-Based Heat Sink Configurations Under Power Profiles	**Michiel De Paepe**, Maité Goderis, Jana Rogiers, Michel De Paepe
23	IHTC18-1023	Real-Time Steady-State Loss Prediction for Accelerated Calorimetric Loss Measurements	**Jasper Nonneman**, Ilya T'Jollyn, Jeroen De Kooning, Michel De Paepe
24	IHTC18-1053	Improvement of Airflow Paths for Electronic Device Cooling in Air-Cooled Data Centers	**Kunfeng Zhao**, Wenquan Tao, Chunyu Zheng

25	IHTC18-1057	Liquid temperature imaging in heat exchangers using fluorescence anisotropy	Chiharu Sato, Yuto Kamimura, Yoshiyasu Ichikawa**, Masahiro Motosuke**
26	IHTC18-1063	Conformal Coating for Thermal Management in Printed Circuit Boards	**Noam Avtalion**, Gennady Ziskind, Oren Regev
27	IHTC18-1165	PORE-SCALE SIMULATION ON THERMAL PERFORMANCE OF GRADIENT-DISTRIBUTED HYDROGEL	**Wenxin Li**, Wenyan Chen, Tao Tao
28	IHTC18-0583	Freely Propagating Hydrogen Flames in Water Mists: Insights from One-Dimensional Simulations	**Gabriel Barbosa Paganini**, Joao Vinicius Hennings de Lara, Fernando Luiz Sacomano Filho, Pedro Magalhães de Oliveira
29	IHTC18-0993	Modeling of a Self-Heated Plate Reactor Applied to Methane Bi-Reforming	**Guilherme Pickler**, Amir Antonio Martins Oliveira, Rafael de Camargo Catapan
30	IHTC18-1116	Thermal Management of Lithium-Ion Batteries in Industrial Electric Vehicles: Modelling, Analysis, and Cooling Strategy Selection	**Mohammadmehdi Baseri**, Marco Marengo, Nilojendu Banerjee

POSTER 5 — INVERSE PROBLEMS + ARTIFICIAL INTELLIGENCE

2026-08-04 16:00–18:00 Alhambra II | Chair: Ali Kosar

No.	Code	Title	Authors (presenter in bold)
1	IHTC18-0096	A Novel Approach to Determine the Specific Heat Capacity of an Orthotropic Material Using Modified-Physics Informed Neural Network	**Sai Krishna**, C. Balaji, Balaji Srinivasan
2	IHTC18-0133	Prediction of Two-Phase Flow using Physics-Informed Neural Networks	**Stefan Gietl**, Marcel Günter, Benjamin Dietrich, Thomas Wetzel
3	IHTC18-0254	Strategies for Online Monitoring of Temperatures in Wire Arc Additive Manufacturing	**Gino de Andrade**, Dominic Groulx
4	IHTC18-0354	Direct Prediction of Channel Surface Temperature in a Parallel Microchannel Evaporator Using Infrared Thermography and Deep Learning	Hadee Muhamed, **Md Motiur Rahaman**, Kumar Nishant Ranjan Sinha, Sarit K. Das, Arvind Pattamatta
5	IHTC18-0365	Free-Form Fluid Metamaterials Enabled by Programmable Porous Medium	**Zhaochen Wang**, Pan Luo, Quan Liu, Run Hu
6	IHTC18-0426	An in-situ identification approach for heat exchange characteristics based on physics-informed neural networks combined with heat current analysis	Kelun He, Nan Meng, Qun Chen, **Zhengchun Lou**
7	IHTC18-0440	Physics-informed neural networks (PINNs) for solving moving boundary problems in solid–liquid phase-change heat conduction	**Boyan Gao**, Minghan Xu
8	IHTC18-0455	BAYESIAN ESTIMATION OF A HEAT FLUX FUNCTION WITH TEMPERATURE MEASUREMENTS SPATIALLY COMPRESSED BY INTEGRAL TRANSFORMATION	**Cristiano Henrique Junior**, Modesto Gama, Luiz Fernando Silva Ferreira, Helcio Orlande
9	IHTC18-0462	Heat Input Estimation in Capacitor Discharge Thermocouple Welding Using Inverse Problem, Thermal Modeling and High-Frequency Measurements	**Fábio Silva Faria**, Philippe Le Masson, Rodrigo Gustavo Dourado da Silva, Bruno de Campos Salles Anselmo, Sandro Metrevelle Marcondes de Lima e Silva, Rogerio Fernandes Brito, Elisan dos Santos Magalhães
10	IHTC18-0505	PREDICTION OF THE SPREAD OF POLLUTION FROM AN ENTERPRISE BY MACHINE LEARNING AND COMPUTATIONAL FLUID DYNAMICS METHODS	Aidana Sabyrkulova, **Alibek Issakhov**, Aizhan Abylkassymova
11	IHTC18-0613	Windowed Backward Reciprocity Functional Method for Transient Heat Flux Estimation in Pipes	**Bruno Henrique Marques Margotto**, Carlos Eduardo Polatschek Kopperschmidt, Marcelo Colaco, Wellington Betencurte da Silva, Fabio Bozzoli, Luca Pagliarini, Lucca Cattani
12	IHTC18-0649	A MACHINE LEARNING APPROACH OF SOLVING INVERSE PROBLEM IN TIME-DEPENDENT DIFFUSE OPTICAL TOMOGRAPHY	**Wenjun Jiang**, Sunil Kumar
13	IHTC18-0713	Lagrangian–Eulerian Simulation of Falling Calcium Oxide Particles with Surface Hydration: A comprehensive physical–chemical-thermal model	Adib Bazgir, Yijin Mao, **Yuwen Zhang**
14	IHTC18-0750	OPTIMISATION OF THE EXTERNAL ABSORPTIVITY OF BUILDING WALL FOR IMPROVING BUILDING ENERGY EFFICIENCY	Zhanat Karashbayeva, Suelen Gasparin, **Julien Berger**
15	IHTC18-0822	A Spectral Parametric Reduced-Order Model in the Bayesian Framework for Inverse Heat Transfer Problems	**Julien Berger**, Suelen Gasparin, GUERNOUTI Sihem, César Pacheco, Helcio Orlande
16	IHTC18-0769	Physics-Informed Neural Network-Based Identification for Multi-Source Inverse Heat Conduction	**BIDOU**, BAUZIN, LARAQI
17	IHTC18-0789	A Reciprocity Functional and Classical Integral Transform approach for thermal contact conductance identification in double-layer cylindrical ducts with non-uniform external convection	**Carlos Eduardo Polatschek Kopperschmidt**, Marcelo Colaco, Bruno Henrique Marques Margotto, Wellington Betencurte da Silva
18	IHTC18-0846	Reduced-order modeling for boundary heat flux reconstruction in a hollow cylinder using an improved lumped formulation	**João Marcelo Maris da Silva Filho**, Arthur Vieira da Silva Oliveira, Juan Esteban Luna Valencia, Tony Glantz, Alexandre Labergue, Michel Gradeck
19	IHTC18-0859	Optimizing catalyst distribution for temperature uniformity in direct internal reforming solid oxide fuel cells using surrogate models	Kosuke Kanzaki, Masashi Kishimoto, Yuting Guo, **Hiroshi Iwai**
20	IHTC18-1070	A GPU-accelerated inverse analysis of thermophysical properties in Gas Tungsten Arc Welding (GTAW) simulation	**Ariel Flores Monteiro de Oliveira**, Elisan dos Santos Magalhães, Kahl Zilnyk, Philippe Le Masson
21	IHTC18-1073	Numerical Study of Transient Heat Transfer in the Combustion Chamber of a 7.62mm Rifle	**Bruna Loiola**, Çiğdem Susantez, ALDELIO BUENO CALDEIRA

22	IHTC18-1225	NEAR REAL-TIME INVERSE HEAT CONDUCTION SOLUTION USING LINEAR STRUCTURED FILTER COEFFICIENTS (LSFC)	**Rodrigo Gustavo Dourado da Silva**, Vinícius Bonavides de Castro Campos, Elisan dos Santos Magalhães
23	IHTC18-0770	Experimentally validated machine learning model to predict the thawing rate of surrogates of biopharmaceuticals.	Venkatraman Nagarajan, Bruna Minatovicz, Tibo Duran, Yi Wang, Yangchao Luo, **Bodhisattwa Chaudhuri**
24	IHTC18-1152	Wire-plate Pulsating Heat Pipe: Fluid Dynamics and Thermal Performance	**Larissa Krambeck**, Kelvin Guessi Domiciano, Luca Pagliarini, Fabio Bozzoli, SARA RAINIERI, Marco Marengo, Marcia Mantelli
25	IHTC18-0517	CHANGEPOINT-AWARE GAUSSIAN PROCESS REGRESSION FOR VARIABLE INLET GUIDE VANE PUMP PERFORMANCE CURVE	Sungjin Yang, Jongrak Choi, Jin-Seok Kim, **Yongwoo Shin**
26	IHTC18-1187	IDENTIFICATION OF PARAMETERS FOR A INSULATING MATERIAL BY REDUCED MODEL	**Jianan Ni**, Frédéric Joly, Yassine Rouizi, Olivier Quemener
27	IHTC18-0739	Bayesian optimization of heat-exchanger design under supercritical thermophysical effects for subsea heat recovery.	Carine de Menezes Rebello, Florian Alain Yannick Pradelle, **Anderson Rapello dos Santos**, Patrick Lima, Marco Coradini Tolfo, Cèdric Guyon, Frédéric Rousseau, Idelfonso Nogueira
28	IHTC18-0437	Dynamic Identification of Condenser Cleanliness Factor through a Hybrid Physics-Based and Data-Driven Method	**Xuan Zhang**, Huimin Wei, Jiacun Li, Xiaoyu Yang, Jingwan Ma, Xiaoze Du
29	IHTC18-1078	Two-Stage Inverse Design for Enhancing Heat and Mass Transfer in PEM Water Electrolysis	**Bin-Xin Qiao**, Pu He, Yu-Chen Li, Fan Bai, Zhuo Zhang, Chun-Yu Zheng, Wen-Quan Tao
30	IHTC18-0497	Basic Research Toward Constructing an Optimization Design Model for Pulsating Flow Using Machine Learning	**Jumpei Hatakeyama**, Mizuki Katsumata, Takashi Fukue, Hidemi Shirakawa, Yasuhiro Sugimoto
31	IHTC18-0026	Genetic algorithm for thermophotovoltaic filter design: a numerical case study	Haoming Li, **Dongxu Ji**
32	IHTC18-1126	Data-driven design of self-assembled monolayers for solid-solid interfacial thermal transport	**Shenghong Ju**, Shengluo Ma, Yunwen Wu, Bingyang Cao

POSTER 6 — COUPLED HEAT TRANSFER MODES + RADIATION

2026-08-04 16:00–18:00 El Pardo II | Chair: Alexander Rattner

No.	Code	Title	Authors (presenter in bold)
1	IHTC18-0035	HEAT BALANCE OF A MICRO PRISMATIC BLOCK REACTOR DURING THE DEPRESSIZATION PHASE OF A DLOFC	**Prof Jat du Toit**
2	IHTC18-0041	CFD-MODELLING OF HEAT AND MASS TRANSFER IN STEAM METHANE REFORMING VIA PARTICLE-RESOLVED AND PSEUDO-HOMOGENEOUS MODELS	**Dmitry Pashchenko**, Viacheslav Papkov
3	IHTC18-0052	Experimental and Numerical Investigation of Particle Shape Effects on Radiative Heat Transfer in Packed Beds	**Matthias Tyslik**, Janine Luengen, Bo Jaeger, Martin Schiemann
4	IHTC18-0087	Unit-Cell Model with Effectiveness Assessment for Balanced Counterflow Heat Exchangers: Application to an Offset Strip Fin Array	**Ho Yuen Henry Suen**, Arthur Vangeffelen, Maarten Blommaert, Stefano Carli, Martine Baelmans
5	IHTC18-0130	Evaluation and improvement of the SLW-1 radiative property model for fire simulations	Leandro Calixto da Silva, **Guilherme Crivelli Fraga**
6	IHTC18-0136	Heat Transfer and Dihydrogen Release in Bitumen-Encapsulated Nuclear Waste : Implications for fire safety	**Majd ARMALY**, Paul JOURDA, Alexis COPPALE
7	IHTC18-0198	Design and Modeling of Hydrogel-Based Evaporative Cooling Channels	**Gautier Rouaze**, Zhengmao Lu
8	IHTC18-0221	Active Modulation of Near-Field Thermal Radiation with Weyl Semimetals	**Wenbin Zhang**, Zhen Gong, Changying Zhao
9	IHTC18-0389	CNN-LSTM-based transient thermal analysis and prediction of nano-silver/diamond-GaN microchannel heat sink	**Ao ci**, Bo Xu, Zhenqian Chen
10	IHTC18-0397	FURTHER ON DETERMINSTIC QUANTUM MECHANICS AIMED AT RADIATION HEAT TRANSFER	**PETER VADASZ**
11	IHTC18-0428	Morphological and non-Beerian radiative characterization of a fibrous medium	**Souveton**, Le Dez, Enguehard
12	IHTC18-0472	Thermal-Hydraulic Performance of a Parametric Compact TPMS Gyroid-Pipe Heat Exchanger	Chetan Kumar Sain, Amadeus C. S. de Alcantara, Markus Kober, **Stefan Kazula**
13	IHTC18-0486	BEYOND STEADY-STATE: EXPERIMENTAL EVIDENCE AND CHAOS THEORY ANALYSIS OF FLUCTUATIONS IN THERMAL CONTACT CONDUCTANCE AT HIGH PRESSURES	**Victor Ustinov**, Alexander K. Ustinov, Reinhold Kneer
14	IHTC18-0506	Fast and high-quality thawing system for frozen fruits combining radiative and convective heat transfer	**Kazuma Isobe**, Tomoya Hattori, Kureya Saiki, Yuta Yoshikawa, Yutaka Yamada, Akihiko Horibe
15	IHTC18-0572	Inverse thermography via Monte Carlo infrared rendering and simultaneous sensitivities estimation	Zili HE, Fabrice Rigollet, Anna Glasser, Eric Serre, Jonathan Gaspar, **Léa Penazzi**
16	IHTC18-0728	Direct simulation of radiation and convective heat transfer in periodic porous structures	**Mitsuho Nakakura**, Shun Tamura, Yuki Yagi, Yuya Kubota, Koji Matsubara
17	IHTC18-0766	Thermo-Mechanical Analysis of Molten Salt Storage Tanks under Combined Settlements	**Cao Yufan**, Tang Zhiyi, Wen-quan Tao
18	IHTC18-0774	Evaluating Size and Shape Optimization of Plastic Plate Heat Exchangers for Compactness under Additive Manufacturing Constraints	Mehmet Basaran, Frederik Rogiers, **Maarten Blommaert**
19	IHTC18-0781	Evaluation of High Performance Monte Carlo Ray Tracing Methods for Thermal Radiation in Discrete Element Simulations	Joao Americo Aguirre Oliveira Jr, Lucilla Coelho de Almeida, **Francis França**
20	IHTC18-0793	Passive emissivity switching using microagglomerate of vanadium dioxide particles	**Kazuma Isobe**, Soma Kono, Kaketo Yamauchi, Yutaka Yamada, Akihiko Horibe
21	IHTC18-0844	High-temperature Resistance of Wavelength-selective Emitters with Metal/Insulator/Metal and Insulator/Metal/Insulator/Metal Structures	**Tsuyoshi Totani**, Satoru Odashima, Yoshio Kondo
22	IHTC18-0874	Controlled Absorption: Optimization and Experimental Validation of Radiative Heat Transmission Through Octet-Truss Lattice Structures	**Koda Boldt**, Maxwell Hewes, Todd Otanicar
23	IHTC18-1067	Temporal variation modelling of the normal spectral emissivity of silicon carbide ceramics as induced by oxidation in air up to 1600°C	**Benoit Rousseau**, Léo Gaillard, AOUALI Abderezak
24	IHTC18-1140	EVALUATION OF DATA REGRESSION METHODS APPLIED TO INFRARED THERMOGRAPHY	**Victor Eduardo Corte Baptistella**, Mauricio Mani Marinheiro, Chiara Falsetti, Gherhardt Ribatski
25	IHTC18-1178	Geometric Radiative Instability Explains the Formation of Snow Penitentes	**Wilko Rohlfs**, C.H. Venner, H.G. van der Bijl, A. Maßmeyer
26	IHTC18-1182	Thermal Behavior and Dew Collection Efficiency of Tilted Planar Condensers under Varying Wind Conditions	**Laurent Royon**, Marc Muselli, Sylvain Lefavrais, Daniel Beysens

27	IHTC18-0522	Spectral control coating for solar photovoltaic/thermal system based on VO2 thermochromic material	**Qing He**, Xiao Ren, Liang Gong, John C. Chai, Chuanyong Zhu

POSTER 7 — BOILING AND CONDENSATION (A) + MULTIPHASE FLOWS (A)

2026-08-05 08:00–10:00 Alhambra I | Chair: Luca Pagliarini

No.	Code	Title	Authors (presenter in bold)
1	IHTC18-0126	CFD-Based Design Optimization of High-Efficiency Condensation Heat Exchangers for High-Temperature Heat Pump Application using R-1233zd(E)	**Soo Hwan Lim**, Jung Soo Ok, Cheol Min Kim, Nam Soo Lee, Yong Tae Kang
2	IHTC18-0181	Boiling Assessment using Multi-Phase Lattice Boltzmann Method	**Stephan Leyer**, Liu Guanchen, Pranav Molahalli
3	IHTC18-0232	Towards hybrid machine learning-assisted modelling of heat transfer systems	Nima Nazemzadeh, Jose Loyola-Fuentes, Giulia Righetti, Simone Mancin, **Francesco Coletti**
4	IHTC18-0235	The behavior of droplet impact on superhydrophobic surfaces affected by heat transfer from a cold surface	**Qiu Borong**, Li Bin, Liu Yuehan, Xia Yakang, Li Haiwang, Gao Xuan
5	IHTC18-0242	Experimental investigation of the stainless steel porous structure with water as working fluid in application to flat LHP evaporator at moderate temperatures	Paweł Szymański, **Dariusz Mikielewicz**
6	IHTC18-0245	Influence of Additively Manufactured Grids on Pool Boiling Heat Transfer and Critical Heat Flux	**Irene Marchi**, Alekos Ioannis Garivalis, Giuseppe Macoretta, Ivan Senegaglia, Bernardo Disma Monelli, SAURO Filippeschi, Paolo Di Marco
7	IHTC18-0262	Dropwise condensation of ORC-relevant low surface tension organic vapors on iCVD polymer film	**Jun Soo Kim**, Minjeong Kang, Seokwan Roh, Donghyeong Lee, Sung Gap Im, Youngsuk Nam
8	IHTC18-0283	EFFECT OF REYNOLDS NUMBER ON ICE BLOCKAGE IN COPPER DOUBLE-TUBE HEAT EXCHANGERS	Ricardo Andres Toledo Quiroz, Jack Nihill, **Gary Rosengarten**, Ahmad Mojiri
9	IHTC18-0309	FLOW BOILING HEAT TRANSFER AND PRESSURE DROP OF R32 INSIDE A 6.4 MM ENHANCED TUBE	Marina Brancaccio, Bernd Ameel, Steven Lecompte, Michiel Breughe, **Michel De Paepe**
10	IHTC18-0318	Experimental Investigation of Flow Boiling Instabilities and Regime Transitions in Rectangular Macrochannels	**Demin KONG**, Zhaoguang WANG
11	IHTC18-0320	Spatiotemporally-resolved temperature measurements in nucleate flow boiling in a vertical square minichannel using SDMS-PLIF	Zengchao Chen, Aleksei Lobasov, Surya Narayan, Konstantin Pervunin, Chiara Falsetti, Matteo Bucci, **Christos Markides**
12	IHTC18-0341	Thermal performance evaluation of a wrap-around loop heat pipe with various working fluids	**Jungchan Moc**, Sukkyung Kang, Jungho Lee
13	IHTC18-0406	The Effects of Micropillar Geometry and Hybrid Wettability on Pool Boiling Heat Transfer: A Parametric Study	Yu HU, Hongtao GAO, **Yuying YAN**
14	IHTC18-0435	Fabrication and characterization of a micro-boiling meter for heat transfer measurements on a single nucleation site	**Magali BARTHES**, Francois LANZETTA, Himanshi KHARKWAL, Syed Khizar Hussain SHAH, Laurent ROBERT, Jean-Marc COTE, Eric GAVIGNET, Sébastien Euphrasie, Lounès TADRIST
15	IHTC18-0483	OPERATIONAL LIMITS AND FLUID SELECTION CRITERIA FOR ALKALI METAL HEAT PIPES IN HIGH-TEMPERATURE APPLICATIONS	**Leonardo Sonego Hatschbach**, Nelson Yurako Londono Pabon, Marcia Mantelli
16	IHTC18-0561	Flow Boiling Pressure Drop in a Single Microchannel and Comparison with Correlations	Joseph J. Widgington, Atanas Ivanov, **Tassos Karayiannis**
17	IHTC18-0606	Numerical Modelling of Cavity Stability and Vapour Retention in Nucleate Pool Boiling	**Mitchell Steven Whiting**, Ilya T'Jollyn
18	IHTC18-0706	Experimental study of the collisions between successive drops impacting a heated wall under saturated low-pressure conditions	**Florise Noel**, Romuald RULLIERE, Jocelyn BONJOUR
19	IHTC18-0812	INFLUENCE OF THERMOPHYSICAL PROPERTIES OF REFRIGERANTS ON NUCLEATE BOILING HEAT TRANSFER	**Matthias Welzl**, Fatih Meral, Florian Heberle, Dieter Brüggemann, Andrea Luke
20	IHTC18-0902	Thermodynamic Performance of a Cascaded Cycle with Low-GWP Refrigerants R1234ze(E) and R1234yf for Sustainable Cooling	**NEERAJ KUMAR SHARMA**, Ranganayakulu Chennu, Suvanjan Bhattacharyya
21	IHTC18-0999	Secondary heat source assisted pooling boiling heat transfer enhancement on a phase change material coated substrate	**Ying Chen**, Huichang Wang, Jiacheng He
22	IHTC18-1050	Towards data-driven boiling models using a mixture-of-experts approach	**Omid Bidar**, Marco Colombo
23	IHTC18-1110	Investigation of Droplet Impact and Boiling Dynamics on Heated Transparent Surfaces with Tunable Wettability	**Tibin M Thomas**, Huihan Yang, Prashant Valluri, Khellil Sefiane
24	IHTC18-1171	Enhanced Boiling and Evaporation of Dielectric Fluids on Modified Surfaces	**Pavlenko Aleksandr**
25	IHTC18-0296	Energy Conversion in Condensate Droplet Coalescence: From Jumping to In-Plane Kinetic Energy on Inclined Superhydrophobic Surfaces	**Nan ZHOU**, Xin Wang, Zhiqiang Zhu, Zhenqian Chen, Bo Xu

26	IHTC18-0987	Comparative Analysis of Parameters Influencing Heat Transfer in Pulsating Heat Pipes	**Mateus Henrique Corrêa**, Victor Gouveia Ferrares, Cristiano Tibiriçá
27	IHTC18-0869	Experimental Investigation of Hydrocarbons during Flow Condensation in Smooth and Structured Tubes	Christos Tsitsiloudis, **Andrea Luke**
28	IHTC18-0519	HIGH SPATIOTEMPORAL RESOLUTION SURFACE TEMPERATURE MEASUREMENT USING TEMPERATURE-SENSITIVE PAINTS FOR PHASE CHANGE STUDIES	**Zhongqi Liu**, Yan Yan, Wenxuan Pu, Xiaolong Ma, Dongsheng Wen
29	IHTC18-0270	Investigation on the Measurement and Dynamic Evolution of the Air Film During Droplet Impact on a Heated Surface	**Han Tianyu**, Li Yuhang, Xu Ruijie, Xia Yakang, Li Haiwang, Gao Xuan
30	IHTC18-0719	NUMERICAL INVESTIGATION OF VAPOR CONDENSATION ON MICROSTRUCTURED SURFACES	Tong Zheng, Weiwei Jin, Xiangwei Yin, Shengqiang Shen, **Gangtao Liang**, Qinggang Qiu, Xingsen Mu
31	IHTC18-1108	SPRAY COOLING: FROM FUNDAMENTAL HEAT TRANSFER PHENOMENA TO IMPROVED PERFORMANCE THROUGH ADVANCED SURFACE ENGINEERING	**Anton Surtaev**, Aleksandr Sarapulov, Matvey Polovnikov, Mikhail Peshkov, Dmitriy Feoktistov, Ekaterina Lazurkevich

POSTER 8 — SUSTAINABILITY AND ENERGY TRANSITION + ENVIRONMENTAL HEAT TRANSFER AND GLOBAL WARMING

2026-08-05 08:00–10:00 Alhambra II | Chair: Marcello Iasiello

No.	Code	Title	Authors (presenter in bold)
1	IHTC18-0100	Designing an Orifice Plate for a Liquid Tin Methane Pyrolysis Reactor	**Aquila Simmons**
2	IHTC18-0176	Dimensionless Characterization of Porous Electrode Electrochemical Systems Using Modified Hatta and Wagner Numbers: A PEM Fuel Cell Case Study	**Paulo Vitor de Faria**, Marcus Vinícius Pedron Carneiro, Tamayo Zanforlin Pires de Almeida Motta Dias, Jader Barbosa, Jaime Andres Lozano Cadena
3	IHTC18-0208	HYDRODYNAMIC BEHAVIOR OF BUBBLES IN NICKEL FOAM ELECTRODES USING OPTICAL FLOW	Reinaldo Rodrigues de Souza, José Eduardo Socha Pereira, Jeferson Diehl de Oliveira, Elaine Maria Cardoso, Jacqueline Copetti, **Ana Moita**
4	IHTC18-0210	Decarbonization in Maritime Transport: Potential of Ammonia in Dual-Fuel Engines	**Lucas Marçano**, Florian Alain Yannick Pradelle, Epifanio M Ticona, Fernando Zegarra Sánchez, Renata Nohra Chaar Pradelle, Jorge Ricardo Moura de Souza Junior, Sergio Braga
5	IHTC18-0240	Optical diagnostic measurements of flow and heat transfer of supercritical flows in a heated tube	**Nathan Blanc**, Aleksei Lobasov, Surya Narayan, Konstantin Pervunin, Mayank Mukesh, Christos Markides
6	IHTC18-0251	Cooling-Assisted Enhancement of Photovoltaic Panel Performance through Advanced Evaporative Strategies	Clara Gascó Arranz, Pedro Navarro Cobacho, Manuel Lucas Miralles, Pedro Martínez Martínez, **Javier Ruiz Ramírez**
7	IHTC18-0313	Temperature Analysis and Thermal Management of a Hydrogen Fuel Cell Stack: Design and Operational Insights	**Luca Dias Tavares Louzada**, Hiago David Zogbi Silva Oliveira, Lisiane Mattos, Isabela Florindo Pinheiro
8	IHTC18-0361	Prediction of Seebeck coefficient by computing the solvation entropies of metal complexes using RISM theory	**Riku Enomoto**, Yoichi Murakami
9	IHTC18-0382	Concentric multi-layer evaporator integrating solar, electrothermal, and wind energy for sustainable seawater desalination	**Younghoon Suh**, Sang Joon Lee
10	IHTC18-0427	Numerical investigation of a proposed low-cost near-ambient Stirling cooler for developing economies	**Wilhelm Johann van den Bergh**
11	IHTC18-0576	Techno-economic analysis of cascading heat pumps for production of process steam	**Richard Law**, Henry Baker
12	IHTC18-0624	Thermal Impact of Rooftop Photovoltaic Panels on Roof Surface Temperature and Street Canyon Air Temperature in an Industrial Urban District: A CFD Study	**Hamidreza Mohammadpour**, Stephanie Giroux, Svetlana Tkachenko, Liliane Bou Nassif, Hervé Pabiou, Eric Peyrol, Victoria Timchenko
13	IHTC18-0733	Case Study on Performance Testing and Evaluation of plume abatement Cooling Towers	**Songzhiyong**, HUANG Wenhui, Huang chunhua, Wang Yushi, Gong Fuhao, Wang Yinuo
14	IHTC18-0736	Thermodynamic and economic performance assessment of offshore blue NH3 systems with early subsea CO_2 removal.	Anderson Rapello dos Santos, Hamza Alahmad, Carine de Menezes Rebello, Fábio Alves Albuquerque, Marcello Augustus Ramos Roberto, Carlo de Faria Sebok, Ana Paula Santana Musse, Cláudia Gonçalves Honnicke, Marcos Coradini Tolfo, Idelfonso B. R. Nogueira, Cèdric Guyon, Frédéric Rousseau, **Florian Alain Yannick Pradelle**
15	IHTC18-0737	Thermodynamic evaluation of hybrid offshore production systems integrating subsea CH_4/CO_2 separation and blue ammonia synthesis: a DOE-based approach.	**Anderson Rapello dos Santos**, Fábio Alves Albuquerque, Cláudia Gonçalves Honnicke, Hamza Alahmad, Idelfonso Nogueira, Carine de Menezes Rebello, Cèdric Guyon, Frédéric Rousseau, Florian Alain Yannick Pradelle
16	IHTC18-0901	Development of Additively Manufactured Compact High Pressure Heat Exchanger for Hydrogen Refueling Stations	**Robin Kahlfeld**, Hendrik Müntefering, Felix Müller, Lauris Richter, Paul Gembarski, Ruben Steinhoff, Stephan Kabelac
17	IHTC18-1025	LUMPED MODEL FOR HEAT AND MASS TRANSFER IN REGENERATIVE EXCHANGERS WITH HYGROSCOPIC MATERIALS	Leandro Alcoforado Sphaier, **Victor Ouverney Borges**
18	IHTC18-1026	LUMPED MODEL FOR HEAT AND MASS TRANSFER IN A PSA CO2 CAPTURE SYSTEM FOR NATURAL GAS	**Rayssa Rosa Rodrigues**, Leandro Alcoforado Sphaier
19	IHTC18-1048	Unlocking Negative Emissions with Fuel Cells: Upgrading PEMFC Waste Heat for Direct Air Capture	**Luo Qiwei**, YuSheng Li, Xiangxiang Dong, Haotian Zhu, Hong-Bing Quan, Jialong Huang, Wenquan Tao

20	IHTC18-1027	Water and Thermal Management in Proton Exchange Membrane Fuel Cells: Insights across Different Scales and AI-Driven Operating Condition Optimization	**Lei Chen**, Guoqiu Liu, Zhengyan Li, Lei Xian, Yulong Yu, Shuangyu Lv, Wen-Quan Tao
21	IHTC18-1036	Simulation of compressed GDL/CL transport properties in PEMFCs	**Zhuo Zhang**, Ke Xue, Qi-Wei Luo, Yuan Bin, Weidong Bao, Wenquan Tao
22	IHTC18-1038	Comparative Simulation Study of Full-Size and Typical Unit PEMFCs with Zigzag and Converging-Diverging Flow Channels	Zexi Li, Pu He, Zhuo Zhang, **Hongbing Quan**, Chunyu Zheng, Wenquan Tao
23	IHTC18-1150	MODELING AND OPTIMIZATION OF A HEAT EXCHANGER NETWORK FOR AN INTEGRATED ETHANOL REFORMER AND FUEL CELL SYSTEM	**Eduardo Henrique Madeira**, Eduardo Beathalter, Bruno Oechsler, Rafael de Camargo Catapan
24	IHTC18-0760	Transient Thermal Modeling of Geothermal Wells During Drilling	Zahra Negahdari, Jan Einar Gravdal, **Boris V. Balakin**
25	IHTC18-0393	Design and Synthesis of ortho-fluorinated bis-azobenzene photoswitch with superior photochemical performance for solar thermal energy storage	**Haiyi Du**, Juan Shi, Zhenqian Chen
26	IHTC18-0247	Isothermal compression in liquid piston compressors – effect of PCM configurations	Meghana Athadkar, **Sylvie Lorente**
27	IHTC18-1226	A PRELIMINARY STUDY OF THE INFLUENCE OF GAS SUPPLY STRATEGY FOR OPERATION OF microCAES	**Zbigniew Buliński**, Tomasz Krysiński, Bartłomiej Rutczyk, Ireneusz Szczygieł, Dominik Gryboś, Jan Markowski, Jacek Leszczyński
28	IHTC18-0457	The influence of vane leading edge shape in the performance of a s-CO2 centrifugal compressor with vaned diffuser	**Rafael Eller**, Elóy Gasparin, Leandro Salviano, Jurandir Itizo Yanagihara
29	IHTC18-1146	USE OF A VENTILATION SYSTEM TO REDUCE THE TEMPERATURE OF A PHOTOVOLTAIC PANEL - AN EXPERIMENTAL APPROACH	**Luiz Otávio Algave Chaves**, Lourival Filho, Eduardo Ramos Soares, Claudia Rosa do Espirito Santo Nobrega
30	IHTC18-0800	In-Liquid Plasma Fuel Synthesis for Carbon Neutrality and Carbon Recycling	**Shinfuku Nomura**, Ryota Shiba, Junichi Nakajima
31	IHTC18-0853	Optimizing rooftop photovoltaics, cool roofs and green roofs for AC demand coverage and urban heat mitigation	**Hamza Nisar**, Christophe Ménézo, Matthaios Santamouris

POSTER 9 — NUMERICAL, ANALYTICAL AND HYBRID SOLUTION METHODS

2026-08-05 08:00–10:00 El Pardo II | Chair: Michael Ohadi

No.	Code	Title	Authors (presenter in bold)
1	IHTC18-0124	THE USE OF AN ACCURATE ANALYTICAL SOLUTION FOR NORMAL ALBEDO OF SNOW TO ESTIMATE A CONVERGENCE OF MONTE CARLO SIMULATION	**Leonid Dombrovsky**, Jixun Sun, Junming Zhao
2	IHTC18-0125	LAYER-BY-LAYER MODELLING OF HIGH-VACUUM MULTILAYER INSULATION FOR INDUSTRIAL PIPELINES DESIGN	**Fabio Capolupo**, Alfonso Motta, Carmine d' Alessandro, Marilena Musto, Roberto Russo
3	IHTC18-0326	A Lattice Boltzmann solver for atmospheric ice crystal growth	Kaj Pettersson, Dario Maggiolo, **Gaetano Sardina**
4	IHTC18-0395	New analytical solutions for solving a 2D heat conduction problem with two mixed boundary conditions and application to the thermal characterization of stretched elastomer	**Bertrand Garnier**, Jerome Delmas
5	IHTC18-0487	Analytical and Numerical Methodology for the Temperature Distribution on Surfaces Exposed to a Radiant Heat Source	**José Lages**, Eduardo Dias Correa, Gustavo Rabello dos Anjos, ROGERIO GAMA
6	IHTC18-0496	FUEL FLOW MALDISTRIBUTION AND HEAT TRANSFER IN A SPIRAL TUBE HEAT EXCHANGER	Yu Li, Yang Liu, **Jingchun Min**, **Jingchun Min**
7	IHTC18-0532	Hybrid Integral Transform Solutions of Linear Heat Diffusion in Irregular Geometries: Comparison of Coincident and Fictitious Domain Approaches	**Marina Miranda Cohen**, Leandro Alcoforado Sphaier, Isabela Florindo Pinheiro
8	IHTC18-0571	Monte Carlo method for numerical heat transfer : coupling with nonlinear radiation	**Mathis Boiteau**, Olivier Authier, Stéphane Blanco, Mouna El Hafi, Vincent Forest, FORTUNAT Adjovi Alexandra, Richard Fournier, Christophe Peniguel, Isabelle Rupp, Vincent Eymet, Ahmad Sayed Kassem
9	IHTC18-0634	GPU Fully-Implicit Finite Volume Solver Verification for Turbulent Natural Convection in an Enclosure	**Arthur Mendonça de Azevedo**, Elisan dos Santos Magalhães, Guilherme Borges Ribeiro, Sandra Boetcher
10	IHTC18-0659	A quantum computing approach of heat migration in district heating pipeline flow	Qun Chen, Chao Zheng, Qun Chen, Yonglin Xin, Huan Ma, **Runhang Teng**, Hang Li
11	IHTC18-0687	Two-Dimensional Liquid Film Approach Applied to Diffusion Heat Exchange	**Rodrigo Petrone**, Tânia Suaiden Klein, Luiz Fernando Lopes Rodrigues Silva
12	IHTC18-0689	Morphological and Thermal Characterization of a Porous Geopolymer and simulation of heat transfer by the Monte Carlo method formulated in path space.	**FORTUNAT Adjovi Alexandra**, Mouna ELHAFI, Richard FOURNIER, Kokou N'WUITCHA, Frédéric TOPIN, Léa PENAZZI, Stéphane BLANCO, Nathalie EHRET
13	IHTC18-0727	Coupled Multiphase Flow and Reaction Study in a Flexible Peristaltic Reactor: Impact of Wall Glucose Absorption on Solid-Phase Cellulose Conversion	**Du Zhang**, Chang Zhang, Ao Xia, Junjun Wu, Yun Huang, Xianqing Zhu, Xun Zhu, Qiang Liao
14	IHTC18-0836	Quantum algorithm with Carleman-Taylor linearization for reacting flow	**Takaki Akiba**, Youhi Morii, Minhyeok Lee, Kaoru Maruta, Yuji Suzuki
15	IHTC18-0851	Parametric Analysis of an Extended Graetz Problem using the Generalized Integral Transform Technique	**Marcos Brito**, Daniel Chalhub, Leandro Alcoforado Sphaier
16	IHTC18-0879	Thermal performance analysis of a university data center based on field measurements and CFD simulations	Fernando da Silva Almeida, **Andreza Ribeiro**, Fernando Goncalves de Souza, Nelson Yurako Londoño Pabon, Marcia Mantelli, Martin Ordenes
17	IHTC18-0982	Integral Transform Solution of Immiscible Two-Phase Flow in Porous Media with Capillary Pressure Effects	**João Quaresma**, Gianfranco Stieven, Renato Machado Cotta, Paulo Couto
18	IHTC18-1037	A universal strategy of supermesh construction for arbitrary non-conformal interfaces in 3D unstructured grids	**zihan wang**, Kong Ling, Jiangnan Zhu, Quan Wen, Yi Xiao, Chunyu Zheng, Wenquan Tao
19	IHTC18-1068	SIMULATING HEAT TRANSFER IN A PRISMATIC BLOCK VERY HIGH TEMPERATURE REACTOR USING A 1D/3D THERMAL FLUID CO-SIMULATION METHODOLOGY	**Ockert Koekemoer**, C.G. du Toit
20	IHTC18-1096	A novel coupling algorithm between electronic and ionic potentials in proton exchange membrane fuel cells	**Fan Bai**, Ruo-Xuan Fan, Si-Yuan Yang, Bin-Xin Qiao, Zhuo Zhang, Lei Chen, Wen-Zhen Fang, Wen-Tao Ji, Wen-Quan Tao
21	IHTC18-1097	Numerical simulation of an integrated RCCS with a full representative PMR200 Reactor in Flownex (Part 2)	**Gert**, Prof Jat du Toit
22	IHTC18-1100	Development of Symbolic model by Monte Carlo applied to heat transfer in buildings	**muhammad Yousaf Malik**, Olivier FARGES, Mouna EL HAFI, Benjamin RIOU, Fadi LAHLOU

23	IHTC18-1115	Numerical Investigation of Bubble Dynamics in Micro-Pin-Fin Evaporators: Effects of Pin Geometry, Size and Surface Wettability	Raja Fakhar ul Hasnain, Bhaskar Chakraborty, Anastasios Georgoulas, Eddie Blanco Davis, Guangming Zhang, **Manolia Andredaki**
24	IHTC18-1167	HYBRID SOLUTION OF NON-LINEAR COUPLED HEAT AND MASS TRANSFER PROBLEMS UNDER THE EFFECT OF THERMODIFFUSION	**Elizeu Melo da Silva**, Emanuel Negrão Macêdo, Diego Knupp, João Quaresma, Renato Machado Cotta
25	IHTC18-0237	Enhancing Cooling Efficiency in Methane Transpiration Cooling: A Lattice Boltzmann Investigation at the Pore Scale	**Jianan Ge**, Juan Shi, Zhenqian Chen
26	IHTC18-0073	Parallel mesh adaptation framework for the conjugate fluid-solid numerical simulation of structures burnthrough	**Guillaume Janodet**, Nicolas Dellinger, Bastien Andrieu, Clément Benazet, Bruno Maugars
27	IHTC18-0508	On the Thermal Analysis of Plate Radiators for Transformer Cooling: Effect of Fin Spacing	Mattia Grespan, Adriano Leonforte, Guilherme Santos Machado, Fedrico Bugno, **Diego Angeli**
28	IHTC18-0412	A Correction Theoretical Model for Thermal Expansion Effect in Three-Layer Suspension Adhesive Chip Structures	**Zhiyang Wang**, Haiwang Li, Xianqiang Luo, Zhiping Huang, Yanxin Zhai
29	IHTC18-1149	Numerical study on data center cooling using microencapsulated phase change materials	Pengyang Jin, Yunxiang Liu, Haocheng Wang, Jing Wang, Richard Amankwa Adjei, **Yong Ren**
30	IHTC18-1228	TRANSIENT ANALYSIS OF A COMPACT HEAT EXCHANGER	Fernando Goncalves de Souza, Andreza Ribeiro, Fernando da Silva Almeida, **Gian Marcos Gatti**, Marcia Mantelli

POSTER 10 — APPLICATIONS: BIOHEAT TRANSFER + COOLING OF ELECTRONIC EQUIPMENT

2026-08-06 08:00–10:00 Alhambra I | Chair: Zbigniew Buliński

No.	Code	Title	Authors (presenter in bold)
1	IHTC18-0079	A DATA-CALIBRATED THERMAL MODELLING APPROACH FOR MRI-GUIDED ABLATION	**Mariana de Melo Antunes**, Ida Elisabeth Burgers, Valéry Ozenne, Max Seidensticker, Luigi Nardone, Olaf Dietrich, Manon Desclides, Bruno Quesson, Andrzej Kusiak, Sandro Metrevelle Marcondes de Lima e Silva, Jean-Luc Battaglia
2	IHTC18-0101	Real-Time Estimation of Thermal Dose in Minimally Invasive Ablation Cancer Treatments	Isabella Azevedo dos Santos de Oliveira, João Bragança, **César Pacheco**
3	IHTC18-0102	MITIGATING VOXEL AVERAGING EFFECTS IN MR THERMOMETRY VIA KALMAN FILTER-BASED SPATIAL RESOLUTION	**João Bragança**, valery ozenne, César Pacheco
4	IHTC18-0120	Estimation of temperature field in HIFU hyperthermia therapy using Bayesian particle filters	**Leonardo Antonio Bermeo Varon**, Laura de los Rios Cárdenas, Nilton Pereira da Silva, Helcio Orlande, Wagner Coelho de Albuquerque Pereira
5	IHTC18-0187	Super resolved thermometry using a hybrid method for real-time estimation during microwave ablation procedures	**Ida Elisabeth Burgers**, Mariana De Melo Antunes, Nino Avetikovi, Max Seidensticker, Olaf Dietrich, Valéry Ozenne, Jean-Luc Battaglia
6	IHTC18-0275	Heat source identification in a thermoablation process from a physics-informed neural network model	**Battaglia**, Mariana de Melo Antunes, Ida Elisabeth Burgers, valery ozenne, Nino Avetikovi
7	IHTC18-0607	Efficient Cryotherapy for Joints: A Simplified Thermal Model	Korobova Natalia Yurievna, **Aleksandr Pushkarev**, Yulia Makhmutova, Vladimir Chekmenyov
8	IHTC18-0678	Heat Transfer Simulation of Cryosurgery Using a Liquid Nitrogen Sapphire Applicator	**Aleksandr Pushkarev**, Ivan Burkov, Yulia Makhmutova, Dmitry Zhidkov, Dmitry Tsiganov
9	IHTC18-0682	Experimental Heat Transfer Study of Cryoexposure For Biotissue Decellularization	**Aleksandr Pushkarev**, Valeria Ivannikova, Natalia Saakyan, Dmitry Zhidkov, Dmitry Tsiganov
10	IHTC18-0701	A COMPARISON OF HEAT TRANSFER MODELS FOR THE SOLUTION OF AN INVERSE PROBLEM TO MITIGATE THE DEVICE ARTIFACT IN MAGNETIC RESONANCE THERMOMETRY	**Eber Dantas de Sá Paiva**, valery ozenne, Helcio Orlande, Battaglia, Leonardo Antonio Bermeo Varon
11	IHTC18-0716	Estimation of temperature distribution in biological tissue using Green's function for optimizing heating conditions in ablation therapy	**Tomoki Tani**, Atsuki Komiya
12	IHTC18-0780	THERMAL MEASUREMENTS OF AN HELIUM PLASMA JET EXPOSURE OF AN AGAR PLATE	**Jean-Gabriel BAUZIN**, Eric Robert, Pablo Escot Bocanegra, Amaury Rouillard, Ali Hocine
13	IHTC18-0876	AN INVERSE PROBLEM FOR THE THERMAL CHARACTERIZATION OF FUNGI	**Luiz Fernando Silva Ferreira**, Leonardo Antonio Bermeo Varon, Thomas Pierre, Quentin Monnier, Mayara Gil Castro Santos, Olivier Fudym, Helcio Orlande
14	IHTC18-0889	Comparing Porous and Full Plant Models in CFD Simulations of Plant Factories	**Wito Plas**, Michel De Paepe, Wim Beyne
15	IHTC18-0957	Numerical comparison of different radiative heat transfer models for prostate cancer focal laser ablation therapy	Giovanni Napoli, **Marcello Iasiello**, Assunta Andreozzi, Giuseppe Peter Vanoli
16	IHTC18-1046	Wireless and wearable thermal flow sensor for real-time sweat rate monitoring	**Honoka Yasuda**, Hidefumi Yoshizawa, Chihiro Nakamura, Yoshiyasu Ichikawa, Isao Shitanda, Masahiro Motosuke
17	IHTC18-0432	Diffusion-Bonded Flat Thermosyphons: Casing Material Effects on Thermal Performance	**Larissa Krambeck**, Kelvin Guessi Domiciano, Maria Eduarda Beé, Ricardo Botelho, Lucas Caldas, Maria Cristina Amaral, Bianca Müller Martins, Fabio Antonio Xavier, Marco Marengo, Marcia Mantelli
18	IHTC18-0064	Cooling Strategies for High-Power Gyrotron Cavities under High Heat Flux: Experimental and Numerical Investigation	**Ruggero Guido Bertazzoni**, Stefan Illy, John Jelonnek, Sebastian Ruck, Sebastian Stanculovic, Manfred Thumm, Chuanren Wu
19	IHTC18-0134	Coupled Modelling of a Two-Phase Closed Thermosyphon Heatsink for High-Flux Electronic Cooling	Cameron Turck, Bradley Bock, **Ken Craig**
20	IHTC18-0202	EFFECT OF PHASE CHANGE MATERIAL SELECTION, CELL SPACING, AND DISCHARGE RATE ON PASSIVE BATTERY THEMRAL MANAGEMENT	**James McIntosh**, Dominic Groulx
21	IHTC18-0211	TOPOLOGY OPTIMIZATION OF MULTI-LAYER COLD PLATES FOR DUAL-SIDE COOLING APPLICATIONS	**Abhijeet Banthiya**, Liang Pan, Justin A. Weibel

22	IHTC18-0227	Femtosecond Laser Structuring of Direct Bonded Copper (DBC) for Enhanced Jet Impingement Cooling in Power Electronics	**Seungwoo Kim**, Han Ku Nam, Sanghyung Han, Jun Soo Kim, Chulmin Ahn, Suhyun Maeng, Young-Jin Kim, Youngsuk Nam
23	IHTC18-0233	Phase Change Material Nanosuspension Integrated Cooling for Cyclic Thermal Loads in Electronics	**Mohammed Alabdullatif**, Prasenjit Kabi, Rohit Gupta, Stavroula Balabani, Tiwari K. Manish
24	IHTC18-0285	A Low-Pressure-Drop Pool Boiling Cold Plate with a Tapered Gap for Energy-Efficient High-Power Chip Cooling	**Junyoung Choi**, Seokchan Hwang, Seong Hyuk Lee, Jungho Lee
25	IHTC18-0300	FLOW DYNAMICS INSIDE A MULTI-TUBE ARRAY TWO-PHASE HYBRID COOLER FOR POWER ELECTRONICS	**Alexander Ceperley**, Yohei Iwahashi, Ercan M. Dede, Shailesh N. Joshi
26	IHTC18-0360	Experimental investigations on the transient thermal performance of two-phase immersion cooling systems subjected to power surges	**Sarath S Lal**, C Balaji
27	IHTC18-0367	High Heat Flux Spray Cooling Using a Low-GWP Dielectric Fluid: Effects of Surface Roughness on Evaporation, and Temperature Uniformity	Viraj Dusane, Lokesh Dinakaran, Ramesh Narayanaswamy, Arvind Pattamatta — **presented by Md Motiur Rahaman**
28	IHTC18-0372	Improving the heat dissipation performance of shock resistant composite materials and developing a thermal via structure for high-density electronic packages	Seok Hwan Moon**, Sol Yee Lim**, Kwang Seong Choi, Yong Sung Eom, Ji Ho Joo, Gwang Mun Choi
29	IHTC18-1082	Evaporation-Driven Capillary Flow within Porous Media Achieves Sustained Cooling for High Heat Flux	**Zhou Jimin**, Haowei Lu, Zeng Kecheng, Xu Ruina, Jiang Peixue
30	IHTC18-0095	The role of additive microstructures in heat transfer in pulsating heat pipe	**Slava**

POSTER 11 — CONVECTION (B) + TURBULENCE MODELLING + CONDUCTION

2026-08-06 08:00–10:00 Alhambra II | Chair: Florian Pradelle

No.	Code	Title	Authors (presenter in bold)
1	IHTC18-0023	Turbulent passive scalar dispersion near a heated active wall measured by simultaneous PIV and two-color PLIF	**Wenkun Zhu**, Björn Stelzner, Fabian Hagen, Dimosthenis Trimis
2	IHTC18-0135	Efficient energy wall design through insulation domain optimization	**William Dumontaud**, Julien Berger, Benjamin Kadoch
3	IHTC18-0282	Solid-state thermal rectification via phonon hydrodynamics in graphite	**Xin Huang**, Aoxiang Zhang, Roman Anufriev, Laurent Jalabert, Kenji Watanabe, Takashi Taniguchi, Yangyu Guo, Yuxiang Ni, Sebastian Volz, Masahiro Nomura
4	IHTC18-0335	EXPERIMENTAL STUDY OF CALCIUM CARBONATE DEPOSITION IN A PLATE HEAT EXCHANGER	Karolyna Gomes dos Santos, Diogo Oliveira Padrão, **Robert Jäckel**, Juliana Braga Rodrigues Loureiro
5	IHTC18-0348	Three-dimensional numerical simulations of drift behavior of forced-draft mechanical cooling towers	**lilujun**, zhuqing, songxiaojun
6	IHTC18-0407	Section-wise thermal conductivity formulation for accurate axial temperature prediction in heat pipes	**K Nandakumar Chandran**, Jason Chetwynd-Chatwin, Man Yeong Ha, June Kee Min
7	IHTC18-0439	Improved modelling of transient heat conduction in voxelized heterogeneous media using the Brownian walker method	**ROCH Mattéo**, Franck Enguehard, Cyril Daout, Denis Rochais
8	IHTC18-0456	Turbulence Kinetic Energy Distribution and Heat Transfer in a Porous Layer Induced by Bluff Body Vortex Shedding	Thibaut K Kemayo, Justin Courter, Vishal Srikanth, Chadwick Jetti, Rodrigo R Caballero, **Andrey Kuznetsov**
9	IHTC18-0478	Investigating the effects of Prandtl's secondary flows on SCO2 heat transfer using Reynolds Stress Models	**Chris Bochenek**, Nicholas Lopes, Sandra Boetcher, Mark Ricklick
10	IHTC18-0490	Enhanced thermo-hydraulic performance of a heat exchanger inspired by avian respiratory morphologies	Hyoin Lee, Byeongheon Kim, **Ji Hwan Jeong**
11	IHTC18-0531	A COMPARATIVE STUDY OF THERMAL METAMATERIALS FOR PRECISE CORE TEMPERATURE CONTROL	**Daniel Rubano Barretto Turci**, Kleber Marques Lisbôa
12	IHTC18-0541	Advances in Modeling Turbulent Flow, Heat and Mass Transfer in Heterogeneous Media	**Marcelo De Lemos**
13	IHTC18-0596	Heated fluid weak compressibility modelling	**davi souza**, Luben Cabezas Gómez, Leonardo Santos de Brito Alves
14	IHTC18-0619	Development of approaches to prediction and control of the boundary layer under the influence of surface vortex generators.	**Chukalin Andrey**, Fedorov Ruslan, Kovalnogov Vladislav, Kornilova Maria
15	IHTC18-0636	The Ω Criterion: A Tool for Identifying and Analyzing Vortical Structures in Complex Geometries	**Justina Jaseliūnaitė**, Marijus
16	IHTC18-0788	Computational Case Studies on the Effective Thermal Conductivity of Hierarchical Porous Structures	**Lucas Prado Mattos**, Manuel Ernani Cruz, Julián Bravo-Castillero
17	IHTC18-0941	Coupling of microfluidic sheet spray atomization with local convective heat transfer augmentation	**Alexandros Peteinaris**, Alexandros Terzis
18	IHTC18-0974	Scale Partitioning in Navier-Stokes: Flow and Heat Transfer in Jets and Wakes	Avi Varly, **Herman D. Haustein**
19	IHTC18-1013	Boundary layer analyses of the unsteady natural convection in a circular cavity at high Rayleigh and Prandtl numbers	**Jordi Pallares**
20	IHTC18-1064	Estimation of Two-phase Heat Transfer in Plate Heat Exchangers from Inventory Analysis	Minkyu Jung, Jiwon Song, Hyunkyu Noh, Taesung Kim, **Minsung Kim**
21	IHTC18-1139	DRY COOLING OF A HIGHLY COMPACT EDGE DATA CENTER ENABLED BY AN ADDITIVELY MANUFACTURED METAL–POLYMER COMPOSITE HEAT EXCHANGER	Shruti Mohandas Menon, Andres Sarmiento, Felipe de Castro, **Michael Ohadi**
22	IHTC18-0174	Seasonality of the transport and aggregation properties of ocean submesoscale turbulent flows	**Stefano Berti**, Youri Bek, Apolline Dekens, Guillaume Lapeyre
23	IHTC18-0718	High-Order Implicit Large-Eddy Simulation of Trailing-Edge-Induced Natural Transition on the LS89 Turbine Vane under Ultra-Low Turbulence Conditions	Di Yang, Rui Wang, Dewu Yang, Feng Wang, **Hui XU**
24	IHTC18-0088	Quantitative Interferometric Visualization Study of Gravity Effect on Convective Heat Transfer of Near-Critical CO2 in a Closed Chamber under Bottom/Top Heating Conditions	Lin Chen, **Rui Zhang**, Yizhi Zhang, Atsuki Komiya, Daniel Beysense
25	IHTC18-0244	An energy-based approach to the Reynolds analogy in boundary layer flows	**Jonathan Schmitt**, Davide Gatti, Bettina Frohnapfel, Francesco Secchi

26	IHTC18-0837	Laminar mixed convective flow of high Prandtl number fluids through horizontal channels heated at a uniform heat flux	**Marilize Everts**, Oluwasegun Omosehin, Wilhelm Johann van den Bergh
27	IHTC18-1095	IMPACT OF POLYMER-INDUCED ELASTIC INSTABILITY ON PRESSURE CHARACTERISTICS IN RECTANGULAR DUCT FLOWS WITH IMPLICATIONS FOR THERMAL-FLUID APPLICATIONS	**Jin Gu Kang**, Hyeukgyu Kim, Sangwoo Shin, Beom Seok Kim
28	IHTC18-1076	Experimental Investigation of Flow Distribution and Heat Transfer of Supercritical Pressures CO2 in Heated Vertical Parallel Channels	**Jiaqi Wu**, YULI CAO, Ruina Xu, Jiang Peixue, Zeng Kecheng
29	IHTC18-0880	What is the True Effect of Orificing on the Stability of Natural Circulation Loops?	**Vijayan Pallippattu Krishnan**, Swati Gangwar, Latika Dixit, Satya Sekhar Bhogilla

POSTER 12 — MULTIPHASE FLOWS (B) + MELTING AND SOLIDIFICATION

2026-08-06 16:00–18:00 Alhambra I | Chair: Masahiko Shibahara

No.	Code	Title	Authors (presenter in bold)
1	IHTC18-0036	Influence of horizontal partitions on PCM melting in a side-heated narrow vertical cavity	Giovanni Tanda, **Carlo Alberto Niccolini Marmont du Haut Champ**, Stefano Barberis
2	IHTC18-0078	Effect of solidification conditions on production of gamma-dicalcium silicate from electric arc furnace slag aiming for CO2 curing concrete	**Takao Nakagaki**, Sota Saito, Manami Ito, Tatsuya Sasaki, Koji Sakai
3	IHTC18-0193	Influence of Foam Pore Density Gradient on Melting Heat Transfer in Phase Change Materials	Arthur Vilaronga, Jeferson Diehl de Oliveira, Jean-Pierre Bedecarrats, **José Lara Cruz**, Elaine Maria Cardoso
4	IHTC18-0226	Optimization and Heat Transfer Analysis of a Multi-Tube Heat Exchanger Integrated with Phase Change Material	**Moshe Tshuva**
5	IHTC18-0327	Investigation of High Surface Area Phase Change Material Heat Exchangers	**Jared Williams**, Casey J. Troxler, Dr. Sandra Boetcher
6	IHTC18-0381	Experimental Validation of Heat Transfer Correlations for PCM Melting in a Rectangular Enclosure	**Maité Goderis**, Julie Van Zele, Kenny Couvreur, Wim Beyne, Michel De Paepe
7	IHTC18-0469	Experimental Strain-Based Tracking of Melt-Front Dynamics in Composite Phase Change Materials with Embedded Fiber Optic	**Rachel McAfee**, Christopher Wise, May Battleson, Patrick McCluskey
8	IHTC18-0479	EXPERIMENTAL INVESTIGATION OF TWO-PHASE FLOW CHARACTERISTICS AND VOID FRACTION IN A 5×5 ROD BUNDLE WITH MIXING-VANE SPACER GRIDS	**Roberta Fatima Neumeister**, Gherhardt Ribatski
9	IHTC18-0503	SIMULATION OF DRUG AEROSOL DEPOSITION IN HUMAN UPPER AIRWAY CONSIDERING SOFT PALATE ELASTICITY, ENVIRONMENT AND BREATHING REGIME	**Aidana Sabyrkulova**, Alibek Issakhov, Aizhan Abylkassymova
10	IHTC18-0525	Gas-liquid two-phase flow distribution for microchannel heat exchangers with a high-density tube array	Wen-Tao Ji, **Peng Gao**, Qi Dong, Wen-Quan Tao
11	IHTC18-0569	DEVELOPMENT OF A SEMI-ANALYTICAL SOLUTION FOR THE FREEZING/METLTING OF CYLINDRICAL PHASE CHANGE MATERIAL THERMAL ENERGY STORAGE SYSTEMS	**Mohammaderfan Mohit**, Minghan Xu, Agus Sasmito
12	IHTC18-0577	Numerical Investigation of Transient Interfacial Flow Dynamics in a Sessile Droplet on a Heated Substrate in the Presence of Horizontal Electric Field	**Shuchi Chaurasia**, Johannes Kind, Peter Stephan, Arvind Pattamatta
13	IHTC18-0600	Design of fins and shell geometries for fast PCM melting via concurrent shape-topology optimization	**Andrea Fragnito**, Casper Schousboe Andreasen, Marcello Iasiello, Gerardo Maria Mauro, Nicola Bianco
14	IHTC18-0608	Experimental study of evaporation and deformation of liquid films: Controlling thermocapillary convection on heated structured surfaces	Robin Behle, Peter Stephan, **Tatiana Gambaryan-Roisman**
15	IHTC18-0662	A Numerical Framework for Dynamic PCM: Extending Enthalpy–Porosity with Solid Motion	**Doron Sahray**, Gennady Ziskind
16	IHTC18-0666	Modeling of Gas Bubble Growth in Magmatic Melt	**Andrey A. Chernov**
17	IHTC18-0791	Investigation of the transient flow behaviour in a rectangular PCM encapsulation during partial charging and discharging	Lucas Basile, Kyle Teather, **Kamran Siddiqui**
18	IHTC18-0858	Thermal stress response of casted ceramic-phase change material bricks under charge operation	**Julie Van Zele**, Grégory Largiller, Michel De Paepe, Wim Beyne
19	IHTC18-0940	APPLICATION OF LOWER CRITICAL SOLUTION TEMPERATURE MIXTURES IN DESALINATION AND BRINE CONCENTRATION	**Walter Parker**, Ahmed N. Mahfouz, Jordan D. Kocher, Akanksha K. Menon
20	IHTC18-0954	Experimental Thermal Monitoring of Thermite Reactions in Oil Well Plugging Operations	**Bruno de Campos Salles Anselmo**, Rodrigo Gustavo Dourado da Silva, Fábio Silva Faria, Filipe Caldatto Dalan, Elisan dos Santos Magalhães
21	IHTC18-0970	Roughness Effects on Jet-Induced Ablation: Heat Transfer Insights for Core-Catcher Design	LAPORTE, DJERMOUNE, SEILER, LECOANET, RIMBERT, **Michel Gradeck**
22	IHTC18-1061	Unveiling a bubble-induced deposition-explosion phenomenon	**Huihan Yang**, Masamichi Kohno, Prashant Valluri, Yasuyuki Takata, Khellil Sefiane
23	IHTC18-1144	3D CFD Analysis of Metal-Foam-Enhanced Phase Change Material Thermal Storage	**Mehdi Falsafioon**, Arash Bastani, Justin Tamasauskas
24	IHTC18-0623	Effect of Surface Wettability on Bubble dynamics with Underwater Surfaces	**JianxunHuang**, Ri Li

25	IHTC18-0630	DROPLET DYNAMICS AND HEAT TRANSFER ANALYSIS UPON IMPACT ONTO A TRANSPARENT HEATING SURFACE	**Yan Yan**, Zhongqi Liu, Wenxuan Pu, Xiaolong Ma, Muhammad Amjad, Dongsheng Wen
26	IHTC18-1093	Intermittent Spray Cooling Induced by Relative Motion	Nilojendu Banerjee, **Marco Marengo**, Cameron Tropea
27	IHTC18-0923	Developing an optical diagnostic method for polydisperse slurry flow	Ivan Kabardin, Sergey Dvoynishnikov, **Pavel Lobanov**, Semyon Volkov, Nikolay Gulyaev, Aleksandr Svetonosov

POSTER 13 — THERMODYNAMICS & THERMAL PROPERTIES

2026-08-06 16:00–18:00 Alhambra II | Chair: Hiroshi Iwai

No.	Code	Title	Authors (presenter in bold)
1	IHTC18-0024	A Semantic Web Ontology–Driven Framework for Thermodynamic Power Cycle Generation	**MOUGENOT Louis**, François Lanzetta, Philippe Baucour, Nicolas Gaud
2	IHTC18-0072	Thermoanalytical Investigation of the Dehydration Behaviour of $FeCl_2$ and NMC Chloride in Spray Roasting	**Linus Pölling**, Martin Schiemann
3	IHTC18-0112	PERFORMANCE ANALYSIS OF A CUSTOMIZED SHELL-AND-PLATE HEAT EXCHANGER FOR MICROTURBINE WASTE HEAT RECOVERY	**Carlos Eduardo Reuther de Siqueira**, Marcelo Colaco, Carolina Palma Naveira Cotta
4	IHTC18-0157	An Efficient Metal-Hydride Desorption–Fuel-Cell Integrated with an ORC-Based WHR System: Numerical and Thermodynamic Assessment	Hui Zhang, **Hongnan Zhang**, Davoud Abdi Lanbaran, Yuanpeng Yao, Zhen Wu, Bo Li
5	IHTC18-0225	Detection of helium concentration in air by using the 3 omega method with a suspended microheater	Chang-Ui Jeon, **Dong-Wook Oh**
6	IHTC18-0297	A Dual-Fuel Approach for Emissions Reduction in Agricultural Diesel Engines: An Experimental Study.	**MASOUD GHANBARI KASHANI**, Gabriel Coelho Rodrigues Alvares, Alex Pereira da Cunha, Paulo Sérgio Barbosa dos Santos, Leandro Oliveira Salviano
7	IHTC18-0409	Study on the influence of circulating water flow variations of thercharacteristics of natural draft counter-flow wet cooling towers	**XIAOJUN SONG**, lilujun, Cen Yang, HUANG Wenhui
8	IHTC18-0411	Research on the rapid evaluation for the quality and thermal insulation ability of TBCs based on terahertz technology and first principles calculation	**Gu yanqi**, Li Haiwang, Mao Feiyu, Fu Wenyan
9	IHTC18-0581	Pressure-Dependent Through-Plane Thermal Resistance of PEMFC Gas Diffusion Layers Measured by Infrared Thermography and Inverse Analysis	**Simon Winter**, Tim Goettlich, Hiroki Hamma, Thorsten Helmig, Reinhold Kneer, Wilko Rohlfs
10	IHTC18-0594	A CONTINUOUS PRESSURE-DRIVEN ADSORPTION HEAT PUMP UNDER VARIABLE PARTICLE ADSORBENT FLOW IN A 1D DYNAMIC MODEL	**Paris Pasqualin**, Fabio Boccamazzo, Gunjan Auti, Hirofumi Daiguji
11	IHTC18-0597	ESTIMATION OF THE RHEOLOGICAL PROPERTIES OF NON-NEWTONIAN FLUIDS VIA NUMERICAL OPTIMIZATION	SARA RAINIERI, **Luca Pagliarini**, Umberto Neviani
12	IHTC18-0639	MACHINE LEARNING PERFORMANCE PREDICTION OF A MICROTURBINE ON A BRAYTON CYCLE WITH MIXTURES OF NATURAL GAS	**Thaís Doll Luz**, Ederson Sandrin, Edson Bazzo, Alexandre Kupka da Silva
13	IHTC18-0642	NUMERICAL MODELING OF AN EXPERIMENTAL MICRO-TURBINE FOR ASSESSING NATURAL GAS COMPOSITION EFFECTS	**Ederson Sandrin**, Thaís Doll Luz, Edson Bazzo, Alexandre Kupka da Silva, João Vinicius Monteiro Lima
14	IHTC18-0645	Thermal Assessment of Partially Cracked Ammonia-fueled Gas Turbine System	Jing Zhou, **Fei Duan**
15	IHTC18-0709	Waste Heat Recovery Technologies for Industrial Processes and Data Centers	**Akanksha Menon**, Nadia Zaleski, Ricardo Valladares
16	IHTC18-0755	Optimization of a Transcritical CO_2 Heat Pump System with Auxiliary Return-Water Heat Recovery for District Heating	**Ebraheem Alanazy**, Zahra Hajabdollahi, Mohammed Alruwaili, Michael Abbas, Daniel Clark, Zhibin Yu
17	IHTC18-0768	Thermodynamic Analysis and Optimisation of Solar Dish Stirling System using Entropy Generation Minimization Method	Catherine Gidlow, **Tunde Bello-Ochende**
18	IHTC18-0803	Thermoacoustic Amplifier for Enhanced Acoustic Energy Harvesting	**Lihui Gu**, Yue Zhang, Abdur Rehman, Geng Chen
19	IHTC18-0826	HIGH THERMAL CONDUCTIVITY METAL-POLYMER COMPOSITE MATERIAL FOR BIPOLAR PLATES OF HIGH-TEMPERATURE PEM FUEL CELLS	Shiyao Li, Victor Belousov, **Hui Zhang**, Bo Li, Hongnan Zhang
20	IHTC18-0841	EXPERIMENTAL ANALYSIS OF A RADIATOR-TYPE HEATER ASSISTED BY THERMOSYPHONS OPERATING PRINCIPLE	Victor Vaurek Dimbarre, Larissa Krambeck, Felipe Mercês Biglia, PAULO HENRIQUE DIAS DOS SANTOS, Marcia Mantelli, **Thiago Antonini Alves**
21	IHTC18-0927	Thermophysical Properties of Binary Fluorinated Fluids: Numerical Study of FC-72/FC-770 and FC-72/HFE-649 Mixtures	Dadas Norbert, **Artur Piasecki**
22	IHTC18-1127	Quantitative Imaging of Thermophysical Properties Enabled by Lock-in Thermography	**Hosei Nagano**, Ryohei Fujita, Sho Umeda, Kouhei Tanaka
23	IHTC18-1132	Theoretical and Experimental Analysis of Intake Air Temperature in a Automotive Turbocharged Engine	Alessandro dos Santos Pereira, Gian Marcos Gatti, **Leonardo Sonego Hatschbach**, Felipe

			Sobreira Borges dos Reis, Nelson Yurako Londono Pabon, Alexandre Moura da Silveira, Marcia Mantelli
24	IHTC18-1227	Flexibility retrofit scheme for gas-steam combined cycle units based on Carnot batteries: A novel solution for full-operating-condition energy regulation and thermodynamic process optimization	**Yuelong Cui**
25	IHTC18-0930	ELECTRICAL RESISTIVITY OF CHROMEL AS A FUNCTION OF TEMPERATURE: EXPERIMENTAL CHARACTERIZATION, ELECTROTHERMAL MODELING, AND AN INVERSE HEAT-FLUX FRAMEWORK	**Carlos Alberto De Oliveira Filho**, Fábio Silva Faria, Sandro Metrevelle Marcondes de Lima e Silva, Philippe Le Masson
26	IHTC18-0159	Thermodynamic Analysis and Optimization of a Biomass Integrated Gasification Combined Cycle	**Al Sebastián Pinillos Márquez**, Gabriel Lisbôa Verissimo, Manuel Ernani Cruz, Albino Leiroz, Gustavo Ribeiro Soares Pinto
27	IHTC18-0020	DEVELOPMENT OF THERMODYNAMIC PROPERTIES FOR AN ALTERNATIVE WORKING FLUID PAIR IN ABSORPTION HEAT TRANSFORMERS	**Nishant Modi**, Satyanarayanan Seshadri
28	IHTC18-0375	Effects of temperature and grain size on the diffusion coefficients of polycrystalline copper: a molecular dynamics study	**Zhimin Wang**, Guigen Ye, Chuanyong Zhu, Liang Gong

POSTER 14 — APPLICATIONS: AEROSPACE + MATERIALS PROCESSING AND MANUFACTURING

2026-08-07 08:00–10:00 Alhambra I | Chair: Bertrand Garnier

No.	Code	Title	Authors (presenter in bold)
1	IHTC18-0129	Preliminary Parametric Design of Compact Gyroid-Pipe Heat Exchangers for Electrified Aero Engines	Amadeus Cavalcanti Salvador de Alcantara, Chetan Sain, Markus Kober, **Stefan Kazula**
2	IHTC18-0236	IN-LINE MONITORING AND CHARACTERIZATION OF ADDITIVE MANUFACTURING BY INFRARED THERMOGRAPHY	**CHAVATTE Théo**, Sanz Celia, Groz Marie-Marthe, Joyot Pierre, MICHAUD Pierre, Sommier Alain
3	IHTC18-0269	Facile Fabrication of Mechanically Robust Superhydrophobic Coatings for Practical Anti-Icing Applications	**Bingyao Ge**, Xiaomin Wu, Fuqiang Chu, Zhifeng Hu
4	IHTC18-0332	Next-Generation Mesochannel Heat Exchangers (MHX) for Aerospace Applications: Materials, Manufacturing, and Thermal-Hydraulic Challenges	**Sunil S Mehendale**, Arun Muley, Michael Stoia, Vyas Duggirala, Venkateswara Reddy
5	IHTC18-0401	ANALYTICAL CORRELATIONS TO PREDICT THE COEFFICIENT OF PERFORMANCE OF VARIOUS AIR CYCLE SYSTEMS FOR COMMERCIAL AIRCRAFT ENVIRONMENTAL CONTROL SYSTEM	Vinay Pratap Singh Negi, **Chennu Ranganayakulu**
6	IHTC18-0485	Experimental Investigation of a D-Shaped Biomimetic Heat Pipe With Gravity-Assisted Condensate Return: Wick Characterization and Thermal Performance Evaluation	Timothy Junior Amevor, **ASHOK K GHOSH**
7	IHTC18-0775	Development and Validation of 1D Simscape-Based Temperature Prediction Model for Electric Motor	**Jinhyeuk Seo**, Ryuk Lee, Soon-O Kwon, Kyoung-Soo Cha, Young-Hoon Jung, Geun-Ho Park, Myungsoo Jang
8	IHTC18-0792	A NOVEL HYDROGEL-FILLED SANDWICH COMPOSITE STRUCTURE TO ENHANCE THE HEAT DISSIPATION CAPABILITY FOR SPACECRAFT	Qi Yan, **Jin Zhao**, Dichu Xu, Guice Yao, Dongsheng Wen
9	IHTC18-0832	EFFECT OF PORE FORMATION ON HEAT TRANSPORT IN ADDITIVELY MANUFACTURED MATERIAL	**Harshita Gupta**, Shirin Dehgahi, Alvaro Martínez, Chung Yu Yeh, Tom Vaneker, Jimmy Faria Albanese, Abhishek Kumar Singh, Davoud Jafari
10	IHTC18-0895	Innovative Approaches in Additivly Manufactured Heat Exchangers Design	Lauris Richter, Robin Kahlfeld, Marco Fuchs, Felix Müller, **Stephan Kabelac**, Markus Richter
11	IHTC18-0973	Dynamic Modeling of an Offset Strip Fin Heat Exchanger Based on its Geometry	**João Pedro Ramos Milhome**, Guilherme Borges Ribeiro, Celso Yukio Nakashima, Francisco Samuel Matos de Morais
12	IHTC18-1009	Thermal modeling of a combustion synthesis taking place in a fibrous medium	**Gerard L. Vignoles**, Elliott Demenois, Cédric Descamps, Thanh-Hà Nguyen-Bui
13	IHTC18-1055	Additively Manufactured Transparent Microchannel with Jacket Cooling: Flow-Rate Effects on Local Temperature Control	**SARBALAND Faisal**, Masahiro Furuya
14	IHTC18-1086	Analysis for the effect of mixer shapes on mixing behavior in flow-type supercritical hydrothermal mixers using computational fluid dynamics	**Yuya Azami**, Takamasa Saito, Seiichi Takami, Masaki Kubo
15	IHTC18-1153	Reaching the critical cooling rate for ZBLAN glass in a simulated continuous flow	**Andrija Djordjevic**, Tad Unger, Stephan Leyer, Hubert Moser, Ryszard Buczynski
16	IHTC18-0075	Spheroidization of Agglomerated Alumina Powders in a Conical RF Inductively Coupled Plasma Torch	**Javad Mostaghimi**, Ali Ebrahimi, Sina Alavi
17	IHTC18-0552	MULTI-STAGE HEAT AND MASS TRANSFER DURING PRECURSOR DROPLET DRYING AND MORPHOLOGY PREDICTION IN HIGH-VELOCITY OXYGEN FUEL SPRAYING	Tara Yazdanimotlagh, Mathew Karaoulis, Alireza Rahimi, Mehdi Jadidi, Moussa Tembely, **Ali Dolatabadi**
18	IHTC18-0011	MULTIDISCIPLINARY PRELIMINARY DESIGN STUDY ON THE EVAPORATOR IN THE WATER-ENHANCED TURBOFAN CONCEPT	**Marc Schmelcher**, Jannik Häßy, Alexander Görtz, Mahmoud El-Soueidan, Florian Herbst
19	IHTC18-0098	Thermal Effects on the Aerodynamic performance in the Low Reynolds High Aspect Ratio Lifting Surfaces of High-Altitude UAVs	Adam Anthony Virtue Okoh, Chaoyue Ji, Peter Thomas, **Hongwei Wu**
20	IHTC18-0981	PARAMETRIC THERMAL ANALYSIS OF STANDARD ARINC 600 ENCLOSURES	**Erika Harumi Akashi**
21	IHTC18-0989	Self-deploying shape memory alloy heat-pipe radiators for spacecraft thermal management	**Tomé Seichi da Nóbrega Guenka**, Christopher Greer, Sven Bilen, Reginald Hamilton, Alexander Rattner
22	IHTC18-1066	Experimental and numerical analyses of a 3D printed wicked flat heat pipe	**Anselmo Cecere**, Daniele Mirabile Gattia, Angelo Tatì

23	IHTC18-1058	Study on the Particle Erosion Characteristics of Thermal Barrier Coating Surfaces Considering the Effect of Roughness	**Wang Yubin**
24	IHTC18-0204	Numerical modeling of nitrogen-cooled extrusion dies: A 3D-1D methodology for porthole dies	Mattia Grespan, Riccardo Pelaccia, **Paolo E. Santangelo**
25	IHTC18-0511	Theoretical and Experimental Studies in Magneto-Plasma Aerodynamics	**Sergei V. Ryzhkov**, Victor Kuzenov
26	IHTC18-0379	ULTRAFAST ENERGY COUPLING AND ANHARMONIC BEHAVIOR OF COHERENT PHONON FLATBANDS	**Yaguo Wang**, Zefang Ye, Travis D. Frazer, Haoran Cui, Xun Jia, Tengfei Ma, Stephen March, Seth R Bank, Katherine J. Harmon, Zhan Zhang, Jan Ravnik, Mathias Sander, Yunpei Deng, Roman Mankowsky, Henrik Lemke, Haidan Wen, Stephan O. Hruszkewycz, Simon Gerber, Yan Wang, Yue Cao

POSTER 15 — BOILING AND CONDENSATION (B)

2026-08-07 08:00–10:00 Alhambra II | Chair: Jean-Gabriel Bauzin

No.	Code	Title	Authors (presenter in bold)
1	IHTC18-0305	A hybrid lattice Boltzmann study of flow boiling in microchannels with two-stage gradient wetting surfaces	**Liangzhen Liu**, Huiying Wu, Jiaxing Zhang, Zhenyu Liu
2	IHTC18-0310	Bubble Dynamics and Heat Transfer in Cavity Heaters using Lattice Boltzmann Methods	**Pranav Rajah Molahalli**, Athanasios Mokos, Iurri Dolganov, Dionysios Stefanitsis, Nikolaos Prasianakis, Stephan Leyer
3	IHTC18-0331	Physics-Informed Neural Networks for Nucleate Boiling	**Saam**, Seohee Jang, Yasser Mahmoudi
4	IHTC18-0399	Experimental Investigation of Heat Transfer Mechanisms in Simultaneous and Non-Simultaneous Two-Droplet Impacts	**Alvaro Felipe Campos Araya**, Thomas Potaufeux, Arthur Vieira da Silva Oliveira, Ophélie Caballina, Michel Gradeck, Guillaume Castanet
5	IHTC18-0536	Combined experimental and analytical approach to vapor bubble dynamics investigation during boiling on enhanced surfaces	**Alexander Ustinov**, Jovan Mitrovic, Ekaterina Masloboeva, Dmitry Ustinov, Yuri Kuzma-Kichta, Andrey Sukhikh
6	IHTC18-0611	Dropwise Condensation Heat Transfer Enhancement by Electrowetting Under Shear Airflow	**Joaquin Ramirez-Medina**, Alidad Amirfazli
7	IHTC18-0638	EXPERIMENTAL EVALUATION OF THE HEAT TRANSFER COEFFICIENT IN FLOW BOILING USING INFRARED THERMOGRAPHY	**Maurício Marinheiro**, Gustavo Aguiar, Gherhardt Ribatski, Matteo Bucci
8	IHTC18-0641	Systematic study of impact of surface geometry on enhancement of boiling outside tubes	Nima Irannezhad, Rasool Mohammadi, **Andrea Diani**
9	IHTC18-0646	Experimental Study of Boiling Heat Transfer on Electron Beam-Modified Surfaces	**Maksim Filippov**, Alexey Dedov, Aleksandr Belyaev, Andrey Sliva, Ilya Pavlov
10	IHTC18-0675	Effect of tilt angle on boiling flow in microchannels for HCPV panel cooling	**Vicente Manuel Soares Pita de Andrade**, Pedro Daniel Fernandes Pontes, Florent Hirtz, Ana Moita
11	IHTC18-0698	Experimental and Numerical Study of Single-Bubble Growth during Depressurization in Room-Temperature Water	**Kazuma Tani**, Seiya Tanaka, Takehiro Himeno
12	IHTC18-0721	Effect of non-uniform heating and a wire coil insert on heat transfer coefficients during flow-boiling in a horizontal tube	Steven Okumu, **Jaco Dirker**
13	IHTC18-0730	Study on the Slip and Heat Transfer Characteristics of Boiling Bubbles on Curved Surfaces	**Yaqi CHENG**, Jiahui Wang, Xuehu Ma, Yi Zheng
14	IHTC18-0751	Enhanced Boiling Heat Transfer via Active-Passive Strategy Coupling Acoustic Field with Micro-Pin-Finned Surfaces	**Zhuye Jiang**, Shichao Bu, Fengzhao Ni, Xiaoping Yang, Yonghai Zhang, Xiang Ma, Jinjia Wei
15	IHTC18-0816	On the Effects of Air Velocity and Surface Wettability during Dropwise Condensation from Humid Air Flow	**Marco Tancon**, Luca Fusina, Antonio Abbatecola, Maria Basso, Elena Colusso, Stefano Bortolin, Davide Del Col
16	IHTC18-0873	Experimental investigation of the in-tube condensation heat transfer for novel refrigerants at low mass fluxes	**Clemens Berger**, Matthias Welzl, Florian Heberle, Dieter Brüggemann
17	IHTC18-0900	Development of a hybrid sensor for time-resolved measurement of fluid temperature and void fraction profile in a heated rod bundle	**Takahiro Arai**, Masahiro Furuya, Tsugumasa Iiyama
18	IHTC18-0951	Bubble dynamics during a power transient at nucleate boiling	**Héloïse Henaff**, Cassiano Tecchio, Jean-Marc Labit, Pere Roca i Cabarrocas, Pavel Bulkin, Marie-Christine Duluc
19	IHTC18-0986	Heat Transfer Performance of a Microstructure Heat Sink Under Flow Boiling Conditions	Ligia Paola Velandia, Enzo Kiishi Ohara, **Debora Carneiro Moreira**
20	IHTC18-0990	Modeling Cryogenic Quenching Dynamics: Validation for Different Coating Thicknesses	**Marco Graffiedi**, Sepideh Khodaparast, Francis J. Dent, Matteo Bucci
21	IHTC18-0998	BUBBLE DETECTION OF LSPR-INDUCED PHOTOTHERMAL MICRO/NANOBUBBLES BASED ON GAS–LIQUID ELECTROCHEMICAL IMPEDANCE	**Jiacheng He**, Yihang Dai, Ying Chen
22	IHTC18-1119	Heat transfer rate and critical heat flux measurements for pool boiling of HFO-1336mzz-Z with varying boiling surface roughness	**Ilya T'Jollyn**, Guilherme Ward Cruz, Jasper Nonneman, Jana Rogiers, Michel De Paepe
23	IHTC18-1154	Development and performance evaluation of self-suction boiling heat transfer for high heat flux electronic cooling	Qining Wu, Shaobo Yang, Sihui Hong, **CHAOBIN DANG**
24	IHTC18-0625	NUMERICAL SIMULATION OF SINGLE BUBBLE GROWTH CHARACTERISTICS ON DIFFERENT MATERIAL SURFACES	**Xiaolong Bi**, Changfu Yan, Weifeng Tang, Chenjie Zhou, Wenxiao Chu, Qiuwang Wang

25	IHTC18-0748	EVOLUTION OF BUBBLE DYNAMICS IN MICRO-SPATIOTEMPORAL SCALE BOILING INDUCED BY REPETITIVE PULSE THERMAL LOADING	**Weifeng Tang**, Yigao Lv, Xiaolong Bi, Chenjie Zhou, Wenxiao Chu, Qiuwang Wang
26	IHTC18-0936	Optimising hyperparameter tuning in machine learning models for flow boiling in microtubes with Bayesian Information Criterion	Nima Nazemzadeh, Tassos Karayiannis, **Francesco Coletti**

POSTER 16 — ENERGY CONVERSION AND STORAGE (B)

2026-08-07 10:30–12:30 Alhambra I | Chair: Julien Berger

No.	Code	Title	Authors (presenter in bold)
1	IHTC18-0099	development of microencapsulated phase change materials for energy efficiency applications	**Caio vinicius Santos Cartaxo**, Marcio CARVALHO, Amanda C. S. N. Pessoa
2	IHTC18-0224	Thermal Performance of Phase Change Material Tubes Integrated in a Ventilated Façade	Qianwen Tan, **Monica Siroux**, Renzhi Wang
3	IHTC18-0230	Design study of an open absorption heat and mass exchanger integrated into a propane air conditioning unit	Thomas Meyer, **Christian Thoms-Meyer**, Stefan Elbel
4	IHTC18-0261	Inverse identification of thermal parameters of a cylindrical lithium-ion cell using vacuum and atmospheric experiments	**Arundas Odungat**, Dr Samarjeet Chanda, Dr. TNC Anand
5	IHTC18-0322	HEAT AND MASS TRANSFER MODELING OF RECTANGULAR PACKED-BED HEAT EXCHANGERS FOR THERMOCHEMICAL ENERGY STORAGE	**Alper Saygin**, Allannah M. Duffy, Srinivas Garimella
6	IHTC18-0325	EXPERIMENTAL EVALUATION OF ENERGY DENSITIES OF SALT HYDRATES IN FINNED-TUBE HEAT EXCHANGERS FOR THERMOCHEMICAL ENERGY STORAGE	**Edward G. Ferreira**, Alper Saygin, Allannah M. Duffy, Srinivas Garimella
7	IHTC18-0352	Heat Transfer Enhancement of Metal Hydride Alloys Using Direct Hydrogen Recirculation: Experimental and Numerical Analysis	**Jejun CHOI**, Minjun Lee, Min Soo KIM
8	IHTC18-0373	Thermochemical bidirectional active temperature control for industrial processes	**Hanna Lösch**, Maoyuan Shi, Inga Bürger, Marc Linder
9	IHTC18-0418	Experimental and numerical characterization of interfacial heat and mass transfer during evaporation of CNT/PS particle-laden droplets on heated substrate	**Zhihao Zhang**, Ruina Xu, Peixue Jiang, Yuying Yan
10	IHTC18-0471	Intelligent production of cold, heat and power for residential applications	**Eric ALBIN**, Israa BARAKAT, Flavia BARONE, Alexandre MALLEY-ERNEWEIN, Thomas SANCHEZ, Shihe XIN
11	IHTC18-0605	Design and Optimization of an Ice-based Latent Heat Thermal Energy Storage System Using Roll-Bond Heat Exchangers	**Renato Elpidio Plomitallo**, Gianluca Slaviero, Giulia Righetti, Claudio Zilio, Simone Mancin
12	IHTC18-0738	Multimodal Spectroscopic Decomposition Enables Operando Imaging of Battery Interfaces	**Xing Zhang**, **Xing Zhang**
13	IHTC18-0849	Experimental investigation of a flexible heat pump for energy efficient heating	**Sarath Babu Kaki**, Zahra Hajabdollahi Ouderji, Andrew McKeown, Zhibin Yu
14	IHTC18-0850	THERMAL ENERGY STORAGE FOR SOLAR INDUSTRIAL PROCESS HEAT UNDER VARIABLE HEAT DEMAND	Yusuf Karakas, Sevan Karabetoglu, Özgür Bayer, **Tuba Okutucu-Ozyurt**
15	IHTC18-0925	THERMAL MODELING OF ORGANIC RANKINE CYCLE VERSUS THERMOELECTRIC GENERATORS: A COMPARATIVE ANALYSES FOR LOW GRADE HEAT SOURCE AND MICROPOWER APPLICATIONS	Juliana Silva Brasil, Flávia Rafaela Blandino, **Cristiano Tibiriçá**
16	IHTC18-0971	Numerical Simulation of a High-Temperature Thermochemical Heat Storage Reactor for Industrial Heating System	**Tianchao Xie**, Michalis Mouratidis, Christos Agrafiotis, Iliana Doliou, Jaimy Gebbeken, Nickolas Vlachos, Abhishek Kumar Singh
17	IHTC18-0138	High Power and Energy Density Cold Storage using Dynamic Phase Change Materials	**Vivek Garimella**, Adrika Vats, Junru Zhu, Muhammad Jahidul Hoque, Nenad Miljkovic
18	IHTC18-0288	Numerical Modeling of an Active PCM Thermal Storage System Using Dimensionless Analysis	**Judith Lukau M'Nyampara**, Ryad Bouzouidja, José Luiz Lara cruz, Cédric Le Bot
19	IHTC18-0840	A Radial Diffusion Fixed-Bed Reactor for p-T Equilibrium Measurements in Salt Hydrate Based Thermochemical Systems	**Marco Ballatore**, Ramin Roushenas, Abhishek K. Singh, Aldo Cosquillo, Marc Linder
20	IHTC18-1181	CONSTRUCTAL DESIGN ANALYSIS OF THE ROLE OF FINS NUMBER IN A PCM RESERVOIR FOR COOLING OF LI-ION BATTERIES	**Giovani Dambros Telli**, Rafael da Silveira Borahel, Leonardo Nunes Pereira, Elizaldo Domingues dos Santos, Liércio Isoldi, Luiz Alberto Oliveira Rocha
21	IHTC18-0051	Analysis on heat propagation in battery module during thermal runaway	**Dongkyu Kim**, Yonggyun Lee, Dongmin Lee
22	IHTC18-1131	Parametrical Analysis of a Photovoltaic–Thermal System with an Organic Rankine Cycle Using R-123	**Gabriel Rabelo Thomaz**, Luís Mauro Moura, Douglas Refosco, Francisco Augusto Aparecido Gomes

POSTER 17 — BOILING AND CONDENSATION + MULTIPHASE FLOWS

2026-08-07 10:30–12:30 Alhambra II | Chair: Michel Gradeck

No.	Code	Title	Authors (presenter in bold)
1	IHTC18-0022	Pressure Influence on Nucleate Boiling Heat Transfer of Carbon Dioxide in comparison with Propane and Methanol	**Fatih Meral**, Prof. Dr.-Ing. habil. Andrea Luke
2	IHTC18-0119	Effect of the Saturation Temperature on Heat Transfer Coefficient During Flow Boiling of R245fa in a Small Diameter Channel	Daniel Borba Marchetto, Alexandre Garcia Costa, **Gherhardt Ribatski**
3	IHTC18-0152	Experimental determination of the temperature field around a single bubble through Schlieren optical technique	**Ivan Talão Martins**, Pablo Fariñas Alvariño, Luben Cabezas Gómez
4	IHTC18-0173	Condensation in the Presence of Non-Condensable Gases: Heat Transfer Performance of Filmwise and Dropwise Modes on Wettability-Engineered Aluminum Surfaces	Subhashita Mata, Harsh Shrivastava, Chayan Das, Saurabh Khatri, Abhijit Raha, **Soumyadip Sett**
5	IHTC18-0191	Self-healing composite coatings for long term steam condensation applications	Zijie Shen, **Jianhui Zhang**, Priya Mandal, Prasenjit Kabi, Manish Tiwari
6	IHTC18-0220	THERMAL PERFORMANCE OF A COMPACT TWO-PHASE CLOSED THERMOSYPHON FILLED WITH SF33	**Sukkyung Kang**, Jungho Lee
7	IHTC18-0253	Experimental insights on the boiling crisis triggering and near-wall void fraction profile in subcooled flow boiling	**Sebastian Rodriguez Rosero**, Florian Chavagnat, Matteo Bucci
8	IHTC18-0280	Experimental study of the flow boiling heat transfer of R455A and R454C inside several multiport mini-channel tubes	**JONG-TAEK OH**, Hoang Ngoc Hieu, Jong Kyu Kim
9	IHTC18-0417	Experimental and numerical study of photothermal liquid films for solar thermal applications	**Boris Balakin**, Jon Thøger Hagen, Mona Øynes
10	IHTC18-0467	Nano-scale mass and heat transport across a liquid-vapor interface	**Gaetan Brunetto**, Stéphane Blanco, Richard Fournier, Marc Miscevic, Pascal Lavieille
11	IHTC18-0833	Flow and Heat Transfer Characteristics of Water-Oil Plug Flow in a Horizontal Circular Tube	**Hiroyuki Kumano**, Takashi Morimoto
12	IHTC18-0883	Numerical Analysis of Heat and Mass Transfer in Microreactors for Biodiesel Synthesis	Antonio Emanuel Marques dos Santos, **Gustavo Rabello dos Anjos**, Gustavo Cesar Rachid Bodstein
13	IHTC18-1114	Mechanistic Modeling of Porous Shell Formation in Drying Bidisperse Suspension Droplets	Boris Krasovitov, Andrew Fominykh, Silas Wolf, Carsten Schilde, **Avi Levy**
14	IHTC18-0076	The influence of surface microgeometry on inducing unstable film boiling	**Anatoliy Levin**, Polina Khan, Alexey Safarov
15	IHTC18-0033	HEAT AND MASS TRASFER PROCESSES IN DROPLETS AND FILMS: NEW APPROACHES TO MODELLING THE PHENOMENA	**Sergei Sazhin**, Vladimir Terekhov
16	IHTC18-0105	Visualization and Measurement of Thermo-Magnetically Driven Flow Using Thermo-Responsive Magnetic Microcapsules	**Keiko Ishii**, Takuma Matsunaga
17	IHTC18-0116	Developing a two-phase flow coarse grid model for nuclear reactor thermal-hydraulics	**Jeggathishwaran Panisilvam**, Shuisheng He, Jean-Marie LeCorre, Bo Liu
18	IHTC18-0122	Oil Retention in Horizontal and Vertical Suction Lines with R455A/PVE in a Cold Chain Refrigeration System	Yoonho Chae, Sarath S.S., **Young Soo Chang**
19	IHTC18-0257	Experimental study on nanobubbles and gas molecule-adsorbed layers at solid-liquid interfaces	**Hideaki Teshima**, Koji Takahashi
20	IHTC18-0274	Dynamic behaviors of cold saltwater droplets impacting supercooled hydrophobic surfaces	**Yabo Li**, Xiaomin Wu, Zhifeng Hu
21	IHTC18-0291	Assessing infectious disease transmission risk from a fluid mechanics perspective: quantifying the role of temperature and relative humidity on exhaled droplet transport and evaporation	**Marco Cavazzuti**, Ludovico Campanelli
22	IHTC18-0364	Experimental investigation on the effect of spacers on liquid film behaviors in vertical annular flow	**Huacheng Zhang**, Yutaro Umehara, Atsuroh Etoh, Shoji Mori
23	IHTC18-0452	Application of a Large-Eddy-Simulation framework for two-phase flows with heat transfer to sloshing tanks	**Damien Fouquet**, Carmona Julien, Moureau Vincent
24	IHTC18-0207	Method to quantify bubble nucleation and wet and dry areas during droplet impact on a heated sapphire prism with Total Internal Reflection imaging	**Arthur Vieira da Silva Oliveira**, Alvaro Felipe Campos Araya, Guillaume Castanet, Michel Gradeck, Ophélie Caballina, POTAUFEUX

25	IHTC18-1224	A 3D Non-Isothermal Investigation of Multiphase Transport and Parametric Sensitivities in PEMFCs Based on Improved Agglomerate Model	**ZhenyuanGuo**, Fan Bai, Yanjun Dai, Jie Zhao, Yungang Wang
26	IHTC18-0139	Condensation Using Simultaneous Mass and Heat Transfer	**Zach Gagnon**
27	IHTC18-0271	Development of LDA method for researching the characteristics of marine aerosol in laboratory modeling of turbulent heat transfer processes between the atmosphere and the ocean in storm under hurricane conditions	**Ivan Kabardin**, V.G. Meledin, S.V. Kakaulin, S.V. Dvoynishnikov, V.V. Rakhmanov
28	IHTC18-0168	Fluid flow in the vicinity of a corner under Dirichlet and under Navier boundary conditions	**Ayelet Goldstein**, Jorge Berger, Ofer Eyal