ASME 2024 SHTC
Summer Heat Transfer Conference

CONFERENCE
July 15-17, 2024

Hilton Anaheim
Anaheim, CA

Program

event.asme.org/SHTC

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SETTING THE STANDARD

Welcome

FROM THE CONFERENCE ORGANIZERS

Welcome to the 2024 Summer Heat Transfer Conference!

The conference is co-located with the Energy Sustainability and Fluids Engineering Divisions summer meetings. SHTC will feature a technical program with over 300 technical presentations, including keynotes, invited talks, panel discussions, workshops, and posters on a wide range of heat transfer-related topics. The Richard J. Goldstein Memorial Symposium will honor an icon in the heat transfer community and will feature over fifteen invited lectures from distinguished heat transfer engineers. A federal funding panel will provide the opportunity for program managers to outline their funding priorities to conference attendees. Professor Jennifer Sinclair Curtis, of the University of California, Davis, will deliver a keynote lecture titled, “Flow Behavior of Aspherical Particles.” Further, as with past Summer Heat Transfer Conferences, we will hear from the winners of the Max Jakob Award and the Donald Q. Kern Award.

Two SHTC short courses are planned for Sunday afternoon, July 14:

“Scientific Machine Learning for Computational Physics,” presented by Prof. Jian-Xun Wang, University of Notre Dame

“Verification and Validation of Computational Simulations,” presented by Prof. Luís Eça, IST Lisbon, Portugal

Additionally, a Career Panel featuring representatives from industry, academia, and national laboratories will give graduate students an opportunity to explore career opportunities. Finally, a Newcomer Social is being planned for those new to the heat transfer community.

The contributions of all the track, topic, and session chairs; authors; reviewers; organizers of the Goldstein Memorial Symposium; and ASME staff have been invaluable to this event. We would like to specifically acknowledge ASME staff, Mary Jakubowski, Mark Avila, and April Tone for helping manage the conference planning, organization, and tool administration. We also thank the track and topic organizers for supporting the technical program, overseeing the paper reviews, and helping maintain high standards. We express gratitude to the organizers of the Goldstein Memorial Symposium for their energetic work in honoring Professor Goldstein. Most importantly, we thank you, the participants, for giving strength to the conference with your technical contributions and professional engagement.

A very special thank you to our sponsors, Boeing, Carrier Corporation, NATIONAL RENEWABLE ENERGY LABORATORY, University of Minnesota, and University of Maryland, for their generous support!

We hope you enjoy the conference and look forward to seeing you in 2025!

Dr. Brent Webb, Conference Co-Chair, *Brigham Young University*

Dr. Zhuomin Zhang, Conference Co-Chair, *Georgia Institute of Technology*

Dr. Rydge Mulford, Student Activities Chair, *University of Dayton*

Contents

Conference Information

REGISTRATION INFORMATION

California Ballroom Foyer, Ballroom Level, Second Floor

Registration Hours:

Sunday, July14, 10:00AM–6:00PM

Monday, July 15, 7:00AM–5:00PM

Tuesday, July 16, 7:00AM–5:00PM

Wednesday, July 17, 7:00AM–5:00PM

EXHIBIT INFORMATION

California Ballroom Foyer, Ballroom Level, Second Floor

Hours

Monday, July 15, 10:00AM–4:00PM

Tuesday, July 16, 10:00AM–4:00PM

Wednesday, July 17, 10:00AM–4:00PM

Don't forget to stop by and visit with our Exhibitors from Boeing, Carrier Corporation, NATIONAL RENEWABLE ENERGY LABORATORY, the University of Maryland, and the University of Minnesota. Their sponsorship and support help to make our conference sustainable.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS INTERNATIONAL

ASME MISSION STATEMENT:
ASME's mission is to advance engineering for the benefit of humanity.

ASME VISION STATEMENT:
ASME's vision is to be the premier resource for the engineering community globally.

AUDIOVISUAL EQUIPMENT IN SESSION ROOMS

All technical sessions are equipped with one LCD projector and one screen. Laptops will be provided by your session chair. Please bring your presentation on a thumb drive 15–20 minutes prior to the session start time. A speaker ready room is available starting on Monday from 7:00AM–5:00PM and and until Wednesday from 7:00AM–5:00PM in the Green Room located in the Ballroom Level, Second Floor.

SPEAKER READY ROOM

The Green Room, located on the Ballroom Level, Second Floor, will be available per the schedule below to review and/or practice your presentation. A screen and LCD Projector will be provided.

Sunday, July 14, 10:00AM–6:00PM

Monday, July 15, 7:00AM–5:00PM

Tuesday, July 16, 7:00AM–5:00PM

Wednesday, July 17, 7:00AM–3:00PM

BADGE REQUIRED FOR ADMISSION

All conference attendees must always wear the official ASME 2024 SHTC badge to gain admission to technical sessions, exhibits, and other conference events. Without a badge, you will NOT be allowed to attend any conference activities.

CONFERENCE AWARD LUNCHEON (TICKET REQUIRED FOR GUESTS ONLY)

The Awards Luncheon will take place during the conference to recognize and celebrate a select group of individuals for their contributions and achievements in heat transfer engineering. The schedule is as follows:

Heat Transfer Division Awards Luncheon is on Tuesday, July 16, 12:05PM–1:35PM in California Ballroom C on the Ballroom Level, Second Floor.

Please attend the luncheon for the conference you signed up for.

CONFERENCE LUNCHES/POSTER PRESENTATIONS

On Monday and Wednesday, Conference lunches for all three conferences will be held from 12:05PM to 1:35PM in California Ballroom C & D located on the Ballroom Level, Second Floor. Please join your fellow attendees for a good meal and a great networking opportunity. Please note, on Monday, we will have the Poster Presentations Competition as well during lunch. Remember to grab a boxed lunch and join the Poster Presenters in support of their hard work.

CONFERENCE APP

All three conferences will be utilizing the ASME Events mobile app to enhance the experience for attendees and speakers in place of a printed program. Connect with Attendees, View Speaker Profiles, Access Session Information, and more! Options may vary by event.

CONFERENCE PROCEEDINGS AND DIGITAL PAPERS

Each attendee will receive an email with a unique code to access digital copies of all the papers accepted for presentation at the conference. The official conference archival proceedings will be published after the conference and will not include accepted papers that were not presented at the conference. The official conference proceedings are registered with the Library of Congress and are submitted for abstracting and indexing and can be purchased. The proceedings are published in the ASME Digital Library. You will be provided with an individual link to the online papers via email. In the event you do not receive the email, send a request to toolboxhelp@asme.org. Conference proceedings will be available 2-3 months after the conference for a fee.

CONFERENCE REFRESHMENT BREAKS

Morning and afternoon breaks will be provided in the California Ballroom Foyer on the Ballroom Level, Second Floor. Come and meet our exhibitors, Carrier Corporation, Boeing, UMD, UMN, NATIONAL RENEWABLE ENERGY LABORATORY, and Los Alamos National Laboratory and join your fellow attendees for a few minutes of networking and discussion. The schedule is as follows:

Monday–Wednesday, July 15–17
10:05AM–10:25AM and 3:15PM–3:35PM

EMERGENCY INFORMATION

If you are experiencing a health emergency, please dial 911. If you are able or someone else is able, please dial 22 and inform the Security personnel so that the hotel can be on the alert for the emergency response team. The hotel also has 24-hour security and officers trained in first aid, CPR, & AED service.

INTERNET ACCESS

Complimentary basic internet is provided in the sleeping rooms if you are staying at the Hilton Anaheim, in the hotel's public space and in the meeting space.

Network: Hilton Honors
Password: 0724

MEMBERSHIP TO ASME (4 MONTHS FREE)

Registrants who paid the non-member conference registration fees will receive a four-month complimentary ASME Membership. ASME will automatically activate this complimentary membership for qualified attendees. Please allow approximately four weeks after the conclusion of the conference for your membership to become active.

Visit www.asme.org/membership for more information about the benefits of ASME Membership.

PRESENTER ATTENDANCE POLICY

According to ASME's Presenter Attendance Policy, if a paper is not presented at the conference, the paper will not be published in the official Archival Proceedings, which are registered with the Library of Congress and are abstracted and indexed. The paper also will not be published in the ASME Digital Collection and may not be cited as a published paper.

MOTHERS ROOM

Balboa C, Concourse Level, Fourth Floor
Monday-Wednesday 7:00AM-5:00PM

This private room is available on a first-come, first-saved basis as a comfortable space for nursing mothers.

A mini refrigerator, water station and electrical outlets will be available.

PRAYER ROOM

Balboa A&B, Concourse Level, Fourth Floor
Monday-Wednesday 7:00AM-5:00PM

This private room is available on a first-come, first-saved basis as a quite space for prayers.

HILTON ANAHEIM PARKING

Current Parking Charges:

Self-Parking
$6.00 for first hour; $2.00 per half hour after that $20.00 Daily Max (no overnight)

Self-Parking (with in & out privileges)
$24.00 per day (Guests only)

Valet Parking (with in & out privileges)
$39.00 per day

Schedule at a Glance

TIME	EVENT	ROOM
SUNDAY, JULY 14		
10::00AM–6:00PM	Registration	California Ballroom Foyer
11:00AM–2:00PM	Heat Transfer Division Executive Committee Closed Meeting	San Simeon A
2:00PM–5:00PM	Heat Transfer Division Executive Committee Open Meeting	San Simeon B
2:00PM–5:00PM	SHTC Short Course 1 – Scientific Machine Learning for Computational Physics	Huntington B
2:00PM–5:00PM	SHTC Short Course 2 – Verification & Validation of Computational Simulations	Huntington A
6:00PM–7:30PM	Opening Reception	California Ballroom A & B
MONDAY, JULY 15		
7:00AM–5:00PM	Registration	California Ballroom Foyer
7:00AM–5:00PM	Speaker Ready Room	Green Room
7:00AM–5:00PM	Prayer Room	Balboa A & B
7:00AM–5:00PM	Mother's Room	Balboa C
8:00AM–9:00AM	The Max Jacob Memorial Lecture	California B
9:05AM–10:05AM	SHTC Newcomer Panel & Social	Coronado
10:00AM–4:00PM	Exhibits Open	California Ballroom Foyer
10:05AM–10:25AM	Refreshment Break	California Ballroom Foyer
10:25AM–12:05PM	K9-01 Radiative Thermal Energy Conversion With Nanostructures	San Simeon A
10:25AM–12:05PM	K6-01 Heat Transfer in Energy Systems – Alternative Power Generation I	Avila A
10:25AM–12:05PM	K10-01 Single-Phase Enhanced Heat Transfer Equipment	Avila B
10:25AM–12:05PM	Goldstein Symposium 01	El Capitan A
10:25AM–12:05PM	K8-01 Fundamentals of Machine Learning In Heat Transfer	El Capitan B
10:25AM–12:05PM	K11-01 Fire and Combustion I	Coronado
10:25AM–12:05PM	K12-01 Aerospace Heat Transfer I	La Jolla
12:05PM–1:35PM	Boxed Lunch/Poster Presentations	California Ballroom C & D
1:35PM–3:15PM	K9-02 Nanothermal Metrology	San Simeon A
1:35PM–3:15PM	K6-02 – Heat Transfer in Energy Systems – Alternative Power Generation II	Avila A
1:35PM–3:15PM	K20-01 Applications of Machine Learning/AI For Heat Transfer	Avila B
1:35PM–3:15PM	Goldstein Symposium 02	El Capitan A
1:35PM–3:15PM	K8-P1 Panel on Fundamentals of Heat Transfer for Climate and Sustainable Energy	El Capitan B
1:35PM–3:15PM	K11-02 Fire and Combustion II	Coronado
1:35PM–3:15PM	K12-02 Aerospace Heat Transfer II	La Jolla
3:15PM–3:35PM	Refreshment Break	California Ballroom Foyer
3:35PM–5:15PM	K9-03 Tunable Thermal Transport	San Simeon A
3:35PM–5:15PM	K18/19-01 Extreme Condition and Environmental Heat and Mass Transfer	Avila A
3:35PM–5:15PM	K20-02 Inverse Problems in Heat Transfer	Avila B
3:35PM–5:15PM	Goldstein Symposium 03	El Capitan A

TIME	EVENT	ROOM
3:35PM–5:15PM	K8-02 Fundamentals of Phonons, Electrons, and Transport Properties	El Capitan A
3:35PM–5:15PM	K15-01 Additive Manufacturing and Heat Transfer	Coronado
3:35PM–5:15PM	K13-01 Flow Boiling In Mini/Microchannels	La Jolla
5:20PM–6:20PM	Goldstein Symposium Sponsored Reception	El Capitan A
TUESDAY, JULY 16		
7:00AM–5:00PM	Registration	California Ballroom Foyer
7:00AM–5:00PM	Speaker Ready Room	Green Room
7:00AM–5:00PM	Prayer Room	Balboa A & B
7:00AM–5:00PM	Mother's Room	Balboa C
8:00AM–9:00AM	Donald Q. Kern Award Lecture	California Ballroom B
9:05AM–10:05AM	SHTC Keynote: Jennifer Sinclair Curtis	California Ballroom B
10:00AM–4:00PM	Exhibits	California Ballroom Foyer
10:05AM–10:25AM	Refreshment Break	California Ballroom Foyer
10:25AM–12:05PM	K9-04 Thermal Transport in Nanomaterials Across Interfaces I	San Simeon A
10:25AM–12:05PM	K6-03 Heat Transfer In Energy Systems – Energy Storage I	Avila A
10:25AM–12:05PM	K20-03 Applications of Computational Heat Transfer I	Avila B
10:25AM–12:05PM	Goldstein Symposium 4	El Capitan A
10:25AM–12:05PM	K8-P2 Panel on Fundamentals of Machine Learning for Heat Transfer	El Capitan B
10:25AM–12:05PM	K15-02 Transport Phenomena in Manufacturing	Coronado
10:25AM–12:05PM	K13-02 Evaporation and Pool Boiling From Enhanced Surfaces	La Jolla
12:05PM–1:35PM	SHTC Awards Lunch	California Ballroom C
1:35PM–3:15PM	K9-05 Radiative Cooling and Radiative Properties of Nanomaterials	San Simeon A
1:35PM–3:15PM	K6-04 Heat Transfer In Energy Systems – Energy Storage II	Avila A
1:35PM–3:15PM	K20-04 Applications in Computational Heat Transfer II	Avila B
1:35PM–3:15PM	Goldstein Symposium 5	El Capitan A
1:35PM–3:15PM	K8-P3 Panel on Fundamentals of Semiconductor Thermal Management	El Capitan B
1:35PM–3:15PM	K15-03 Laser and Optical Manufacturing	Coronado
1:35PM–3:15PM	K13-03 –Enhanced Condensation Heat Transfer	La Jolla
3:15PM–3:35PM	Refreshment Break	California Ballroom Foyer
3:35PM–5:15PM	K9-06 Thermal Transport in Nanomaterials Across Interfaces II	San Simeon A
3:35PM–5:15PM	K6-05 Heat Transfer In Energy Systems - Energy Storage III	Avila A
3:35PM–5:15PM	K20-05 Applications of Computational Heat Transfer III	Avila B
3:35PM–5:15PM	Goldstein Symposium 6	El Capitan A
3:35PM–5:15PM	K8-03 Fundaments of Multi-Physics Transport and Machine Learning	El Capitan B
3:35PM–5:15PM	K16-01 Heat Transfer in Electronic Equipment I	Coronado
3:35PM–5:15PM	K7-01 Thermophysical Properties I	La Jolla

Schedule at a Glance

TIME	EVENT	ROOM
3:35PM–5:15PM	Funding Program Managers Panel	California Ballroom B
5:20PM–6:20PM	SHTC Career Panel	Coronado
WEDNESDAY, JULY 12		
7:00AM–5:00PM	Registration	California Ballroom Foyer
7:00AM–5:00PM	Speaker Ready Room	Green Room
7:00AM–5:00PM	Prayer Room	Balboa A & B
7:00AM–5:00PM	Mother's Room	Balboa C
8:25AM–10:05AM	K9-07 Thermal Transport In Nanomaterials Across Interfaces III	San Simeon A
8:25AM–10:05AM	K6-06 Heat Transfer In Energy System - Components I	Avila A
8:25AM–10:05AM	K10-02 Multi-Scale Multi-Phase Heat Transfer Equipment I	Avila B
8:25AM–10:05AM	K20-W1 Workshop on Inverse Problems and Parameter Estimation in Heat Transfer I	El Capitan A
8:25AM–10:05AM	K8-04 Fundamentals of Thermal Transport In Porous Media and Single-Phase Convection	El Capitan B
8:25AM–10:05AM	K16-02: Heat Transfer in Electronic Equipment II	Coronado
8:25AM–10:05AM	K7-02 Thermophysical Properties II	La Jolla
10:00AM–4:00PM	Exhibits	California Ballroom Foyer
10:05AM–10:25AM	Refreshment Break	California Ballroom Foyer
10:25AM-12:05PM	K9-08 Thermal Transport in Nanomaterials Across Interfaces IV	San Simeon A
10:25AM-12:05PM	K6-07 Heat Transfer in Energy System - Components II	Avila A
10:25AM-12:05PM	K10-03 Multi-Scale Multi-Phase Heat Transfer Equipment II	Avila B
10:25AM-12:05PM	K20-W2 Workshop on Inverse Problems and Parameter Estimation in Heat Transfer II	El Capitan A
10:25AM-12:05PM	K8-05 Fundamentals of Boiling/Condensation Including Micro/Nanoscale Effects I	
10:25AM-12:05PM	K16-03 Heat Transfer in Electronic Equipment III	Coronado
10:25AM-12:05PM	K17-01 Heat and Mass Transfer In Biotechnology	La Jolla
12:05PM–1:35PM	Lunch	California Ballroom C & D
1:35PM–3:15PM	K9-09 Nanoscale Thermal Transport Modeling And Machine Learning I	San Simeon A
1:35PM–3:15PM	K6-08 Heat Transfer in Energy Systems - Waste Heat I	Avila A
1:35PM–3:15PM	K20-06 Methods in Computational Heat Transfer	Avila B
1:35PM–3:15PM	K14-01 Gas Turbine Heat Transfer	El Capitan A
1:35PM–3:15PM	K8-06 Fundamentals of Boiling/Condensation including Micro/Nanoscale Effects II	El Capitan B
1:35PM–3:15PM	K9-11 Evaporative Cooling for Microsystems	Coronado
1:35PM–3:15PM	K13-04 Liquid-to-Vapor Phase-Change at Enhanced Surfaces	La Jolla
3:15PM–3:35PM	Refreshment Break	California Ballroom Foyer
3:35PM–5:15PM	K9-10 Nanoscale Thermal Transport Modeling and Machine Learning II	San Simeon A
3:35PM–5:15PM	K6-09 Heat Transfer in Energy Systems – Waste Heat II	Avila A
3:35PM–5:15PM	K8-07 Thermal Transport in Nanomaterials Across Interfaces III	El Capitan B
5:15PM	Conference Ends	

Committee Meetings

TIME	EVENT	ROOM
SUNDAY, JULY 14		
11:00AM–2:00PM	SHTC HTD EC Meeting – Closed	San Simeon A
2:00PM–5:00PM	SHTC HTD EC Meeting – Open	San Simeon A
MONDAY, JULY 15		
6:00PM–8:00PM	K-6 Heat Transfer in Energy Systems	San Simeon A
6:00PM–8:00PM	K-8 Theory and Fundamental Research	Avila A
6:00PM–8:00PM	K-12 Aerospace Heat Transfer	Avila B
6:00PM–8:00PM	K-13 Heat Transfer in Multiphase Flow	El Capitan A
6:00PM–8:00PM	K-14 Gas Turbine Heat Transfer	El Capitan B
6:00PM–8:00PM	K-15 Transport Phenomena in Manufacturing and Materials Processing	Coronado
6:30PM–8:00PM	K-20 Computational Heat Transfer	La Jolla
TUESDAY, JULY 16		
6:00PM–8:00PM	ASME Journal of Thermal Science and Engineering Applications (JTSEA) Editorial Board Meeting	El Capitan A
6:00PM–8:00PM	ASME Journal of Heat and Mass Transfer (JHMT) Editorial Board Meeting	El Capitan B
6:00PM–8:00PM	K-9 Nanoscale Thermal Transport	Coronado
6:00PM–8:00PM	K-23 Diversity, Equity, and Inclusiveness	La Jolla

Short Courses

SUNDAY, JULY 14 **2:00PM–5:00PM**
HUNTINGTON B, CONCOURSE LEVEL, FOURTH FLOOR

SCIENTIFIC MACHINE LEARNING FOR COMPUTATIONAL PHYSICS

Fee $25

Instructor: Jian-Xun Wang,
Assistant Professor, University of Notre Dame, IN

Course Description: While traditional methods of modeling and simulation using PDEs and numerical discretization have achieved considerable success, they face significant challenges in areas such as inverse problems, uncertainty quantification, and design optimization. These challenges are particularly pronounced in systems where the governing physics are not fully understood, complicating the development of first-principle numerical solvers. Recent advancements in data science and machine learning, coupled with the increasing availability of data, are paving the way for innovative data-enabled computational models. Despite the potential of state–of–the–art machine/deep learning techniques, they confront hurdles like dependency on large datasets, issues with generalizability and extrapolation, and a lack of interpretability. This course aims to address these challenges by introducing scientific machine learning (SciML) techniques that are deeply rooted in physics. These techniques leverage the wealth of existing knowledge about physical systems, including established physical laws and phenomenological principles, to develop transformative machine learning techniques specifically tailored for computational physics and predictive modeling.

Learning Objectives: Participants will learn various aspects of SciML for modeling complex physical systems, including the integration of physics into neural network architectures, the design of hybrid neural solvers via differentiable programming, the use of physics to inform or regularize ML training, and data-driven knowledge/equation discovery with uncertainty quantification (UQ).

Schedule

30 minutes: Introduction
30 minutes: Physics-Informed Neural Network and Neural Operators
60 minutes: Physics-Integrated Differentiable Neural Modeling
30 minutes: Generative Models for Chaotic and Stochastic Systems
30 minutes: Scalable Bayesian Learning and Model Form Discovery

Dr. Jian-Xun Wang

Jian-Xun Wang is an Assistant Professor in the Department of Aerospace and Mechanical Engineering at the University of Notre Dame. He earned his Ph.D. in Aerospace Engineering from Virginia Tech in 2017. Dr. Wang has a multidisciplinary research background, crossing over into SciML data assimilation, Bayesian inference, UQ, and computational mechanics. His research particularly focuses on the intersection of data-driven modeling, UQ, and computational fluid dynamics. He has led research projects sponsored by multiple agencies, including NSF, ONR, AFSOR, and DARPA. Dr. Wang is a recipient of the 2021 NSF CAREER Award and the 2023 ONR YIP Award. He is also an elected member-at-large of the US Association of Computational Mechanics (USACM) Technical Thrust Area on Uncertainty Quantification and the Technical Thrust Area on Data-Driven Modeling.

SUNDAY, JULY 14 **2:00PM–5:00PM**
HUNTINGTON A, CONCOURSE LEVEL, FOURTH FLOOR

VERIFICATION & VALIDATION OF COMPUTATIONAL SIMULATIONS

Fee $25

Instructor: Professor Luís Eça,
Associate Professor, IST, University of Lisbon, Portugal

Course Description: Computational simulations have become an Engineering tool that complements model testing. As for physical models, such capability requires the assessment of the quality of the results, which depends on the mathematical model (basin or wind tunnel for physical models in fluid dynamics) and its numerical solution (instrumentation for experiments).

This course teaches Computational Simulations practitioners to distinguish numerical and modelling errors. It presents the definitions of the different contributions to the numerical error of steady and unsteady flow simulations. Techniques to quantify numerical (Verification) and modelling errors (Validation) in Computational Simulations are presented including examples from practical simulations of Computational Fluid Dynamics (CFD). The course provides a framework for the establishment of the credibility of simulations so that they can be safely used for engineering decisions.

Objectives: You will learn how to demonstrate the quality of your computational simulations and evaluate the accuracy of the mathematical models behind those simulations.

Schedule

30 minutes: Introduction
30 minutes: Numerical Errors and Uncertainties
30 minutes: Code Verification
30 minutes: Solution Verification
60 minutes: Validation

Professor Luís Eça

Luís Eça is an Associate Professor in the Department of Mechanical Engineering of Instituto Superior Técnico (IST) of the University of Lisbon. He received the M.S, Ph.D. and “Agregação” degrees from Technical University of Lisbon in 1987, 1993, and 2009, respectively. He has been working in Computational Fluid Dynamics (CFD) for the last 35 years in cooperation with the Maritime Research Institute Netherlands (MARIN). The main topics of the research have been the simulation of high Reynolds number flows around complex geometries and Verification and Validation in CFD. He is a member of the ASME Standards Sub-Committee in Verification, Validation and Uncertainty Quantification in Computational Fluid Dynamics and Heat Transfer since June 2015. He is also a member of the ASME Standards Committee of Verification, Validation and Uncertainty Quantification since June 2018.

THE MAX JAKOB MEMORIAL AWARD LECTURE (PRESENTED BY AICHE/ASME)

MONDAY, JULY 15 **8:00AM–9:00AM**
CALIFORNIA BALLROOM B, BALLROOM LEVEL, SECOND FLOOR

ELECTROHYDRODYNAMIC-INDUCED EFFECTS ON BOILING HEAT TRANSFER

Professor Walter Grassi
DESTEC – School of Engineering
University of Pisa
Pisa, Italy

Professor Grassi graduated in Electrical Engineering from the University of Pisa in 1974. He started his career with research on transient boiling phenomena. In 1983, he received a U.S. DOE Fellowship for research on jet impingement heat transfer at the University of Houston (Professor J. H. Lienhard IV). He subsequently continued this research and contributed to the International Encyclopedia of Heat and Mass Transfer on this topic. He also investigated mixed convection in internal flows (in collaboration with Prof. F. Incropera, US). In the late 1980s, he founded the LoThAR Laboratory, where the effects of volume force fields on thermal fluid dynamics were investigated, also with the contribution of foreign (from Argentina, Russia, Romania) visiting researchers. Professor Grassi designed and led the first experiment on nucleate boiling in weightlessness conditions, demonstrating that gravity can be conveniently replaced by the electric field, thanks to several microgravity campaigns around the world: aircraft parabolic flights (France), 2 drop shafts (Japan),

2 sounding rockets (Sweden), 2 satellites (Russia), and a final experiment on the International Space Station. Professor Grassi was a member of the Physical Science Working Group for the European Space Agency and the founder and coordinator of the ESA Boiling Topical Team. In the early 2010s he opened new lines of research about geothermal heat pumps (in collaboration with Professor L. Laloui of EPFL Switzerland).

Professor Grassi published more than 100 scientific papers in international journals and conference proceedings, one book on heat pumps and one on solar energy is forthcoming (both with Springer). In Italian he published educational books on building physics and building energy systems and popular science books on energy and thermodynamics, complex systems and about time (book published in English by Springer). He taught courses on different topics at the University of Pisa, Thermodynamics and Heat Transfer at the University of Florence, and supervised more than 100 M.Sc. theses and several Ph.D. theses.

He held several leading positions: President of the Italian Geothermal Union (UGI), member of the European Science Foundation, member of the National Council of Technical Physics and President of the Regional Energy Agency of Tuscany. Moreover, he was Head of the Department of Energy Engineering, Director of the Doctoral Program in Energy Engineering, member of the Academic Senate, of the Board of Directors and Rector's Delegate for Energy. He worked as a research consultant for companies (metal tempering, glass thermal treatments and performances, heat pumps and design of micro-g flying payload) and institutions. A long-lasting activity was performed for ENEA (Italian Department of Energy) concerning energy performance and comfort analysis of different types of buildings up to retirement (2021), including the Italian base in Antarctica. In 2013 Professor Grassi was awarded the Order of the Cherub, the highest academic honor given by the University of Pisa to professors who have contributed to enhancing the prestige of the University through particular scientific merits and who have significantly contributed to the University, holding important institutional and organizational positions within it.

Abstract: The presentation deals with the experimental results obtained during a long lasting research about the influence of applying an electrical field to the boiling process, both on ground and in weightlessness conditions. This has been performed in our laboratory LoThAR (Low gravity and Thermal Advanced Research) in Pisa and in microgravity campaigns around the world: several aircraft parabolic flights (France), 2 drop shafts (Japan), 2 sounding rockets (Sweden), 2 satellites (Russia), and a final experiment on the International Space Station. Two different approaches were tackled:

- The use of the electric field to affect bubbles shape, size, motion and liquid-vapor interface stability. This is the topic essentially experimented in microgravity so far and proved to be quite effective in replacing gravity by the electric field.
- Moreover, the electric fields can also be used to generate injection of ions which transport fluid particles affecting the fluid dynamics of the liquid. This is an effective means of removing vapor from the heating surface with no need of additional liquid replenishment as is the case with traditional liquid jets.

This topic is shortly treated herein showing some of the main experimental results achieved

DONALD Q. KERN AWARD LECTURE

TUESDAY, JULY 16 **8:00AM–9:00AM**
CALIFORNIA BALLROOM B, BALLROOM LEVEL, SECOND FLOOR

PHYSICOCHEMICAL HYDRODYNAMICS OF DROPS AND BUBBLE WITH SURFACTANTS.

Professor Satwindar Sadhal
Professor of Aerospace & Mechanical Engineering and Ophthalmology
University of Southern California
Los Angeles, CA

Professor Sadhal received his PhD at Caltech in Engineering Science in 1978. He is a Professor of Aerospace & Mechanical Engineering and Ophthalmology at USC. He is the lead author of the book, "Transport Phenomena with Drops and Bubbles." He has worked on NASA projects involving containerless processing using acoustic levitation techniques, and has also made fundamental contributions to nonlinear acoustics, particularly streaming phenomenon with liquid drops. His technical contributions include a large body of scientific of literature on fluid, thermal and material transport. He is a Fellow of ASME and the recipient of the 2007 James H. Potter Gold Medal and the 2019 Heat Transfer Memorial Award. His current activity includes ocular fluid dynamics and transport associated with drug delivery, transport and permeability properties of the vitreous humor and retina. His team has conducted research on intravitreal drug delivery in collaboration with the USC Roski Eye Institute for the last several years with funding from Allergan, Inc. and the National Eye Institute (NIH).

Abstract: The motion of drops and bubbles with the presence of surfactants and impurities has been a subject of considerable scientific interest for the past several decades ranging from the basic fluid dynamics and mass transfer to various engineering and scientific applications. It is known that low-solubility surfactants tend to accumulate at the interface, causing retardation of the motion of drops and bubbles. This phenomenon gives rise to concentration dependent interfacial stress leading to interesting fluid dynamics, both within drops and the exterior region.

In this lecture, the fundamental aspects of the interfacial dynamics will be discussed, and the analytical developments related to the effect on the convective transport of surfactants will be presented. Additionally, several practical applications of surfactants associated with bubble dynamics will be discussed. For example, surfactants are useful for the mitigation of gas embolism in blood vessels that can occur during surgical procedures. Surfactants can successfully lead to the reduction of wall shear in the blood vessels reducing the serious negative effects of the presence of bubbles. Another example is the enhancement of boiling heat transfer whereby surfactants, through reduction of interfacial tension, lead to increased bubble departure frequency and a reduction in departure size and thus an increased heat transfer rate. A similar effect also occurs with droplets impacting on heated surfaces where surfactants play a role in raising the Leidenfrost point.

TUESDAY, JULY 16 **9:05AM–10:05AM**
CALIFORNIA B, BALLROOM LEVEL, SECOND FLOOR

FLOW BEHAVIOR OF ASPHERICAL PARTICLES

Professor Jennifer Sinclair Curtis
Professor of Chemical Engineering
University of California, Davis

Jennifer Sinclair Curtis is a Distinguished Professor of Chemical Engineering at the University of California, Davis. Her research focuses on the development and validation of particle flow models that have been extensively adopted by both commercial and open source CFD software packages. She is a Member of the National Academy of Engineering and a Fellow of APS, AAAS, ASEE, and AIChE. She is recipient of AIChE's Margaret Hutchinson Rousseau Award for Lifetime Achievement by a Woman Chemical Engineer, AIChE's Particle Technology Forum's Lifetime Achievement Award, a Humboldt Research Award, a Fulbright Senior Research Scholar Award, ASEE's Chemical Engineering Lectureship Award, ASEE's Benjamin Garver Lamme Award, and the NSF Presidential Young Investigator Award. She received her Ph.D. in Chemical Engineering from Princeton University and her B.S. in Chemical Engineering from Purdue University. She currently serves as Co–Chair of the US National Academies' Board on Chemical Sciences and Technology.

Abstract: Most industrial and geophysical particulate flows involve aspherical particles, and particle shape has been observed to significantly affect flow behavior. For example, NASA is interested in simulating the descent of a spacecraft approaching the Lunar or Martian surface along a specified trajectory, which involves gas jet-soil particle surface interaction through the landing and engine shutdown. In order to predict the erosion of the Lunar or Martian soil (regolith), a description for the flow behavior for the regolith is needed. For Lunar and Martian soils, the particles are highly aspherical and irregular, and these properties of the soil greatly affect the rate of crater growth and the trajectories of the liberated particles.

This presentation will discuss the development of closure models for a particle-phase continuum treatment via the discrete element method that incorporates features of particle asphericity—from simple particle shapes to ones that are more irregular. For highly irregular particles, mechanical interlocking, due to particle asperities or the bulk particle shape, can lead to orders of magnitude change in flowability. In most of our studies, aspherical grains are described using linked and overlapping spheres. With this linked approach, particle flexibility can also be described with a bonded particle model employing virtual bonds between constituent spheres. Such virtual bonds incorporate normal and shear forces, as well as bending and torsional moments, and allow for particle breakage.

SYMPOSIUM IN MEMORY OF PROFESSOR RICHARD J. GOLDSTEIN

Monday, July 15
El Capitan A, Concourse Level, Fourth Floor

Symposium 1	10:25AM–12:05PM
Symposium 2	1:35PM–3:15PM
Symposium 3	3:35PM–5:15PM

Tuesday, July 16
El Capitan A, Concourse Level, Fourth Floor

Symposium 4	10:25AM–12:05PM
Symposium 5	1:35PM–3:15PM
Symposium 6	3:35PM–5:15PM*

*Refreshments to follow

Professor Richard J. Goldstein (1928–2023)

Sponsored by the ASME Heat Transfer Division, we are organizing this Symposium in Memory of Professor Richard Goldstein at the 2024 Summer Heat Transfer Conference. Professor Goldstein passed away on Monday, March 6, 2023, at the age of 94. He was a world-renowned researcher, educator, mentor, and contributor of service in the fields of heat and mass transfer and energy engineering. He made major advances in optical measurement systems for fluid velocity and temperature, development of cooling designs widely used in high-performance gas turbines, and novel and important measurements in thermal convection. He pioneered laser-Doppler velocimetry and hot-wire anemometry measurements and a variety of high-precision mass transfer–based techniques to study free and forced convection. He was the first to experimentally confirm the critical Rayleigh number for instabilities in Rayleigh–Bénard convection with shear-free boundaries. His research has been presented across more than 300 scientific publications. His studies on film cooling, including his ingenious use of shaped holes for film cooling of surfaces, along with his numerous investigations on jet impingement cooling, led to increased efficiency and reliability of high-performance gas turbines for power generation and aircraft propulsion. He is considered to be the "father of film cooling."

Professor Goldstein was born in New York City and graduated from Stuyvesant High School in 1944. After receiving his B.S. in Mechanical Engineering from Cornell University in 1948, he went on to pursue his M.S. degree in Mechanical Engineering (1950) and Physics (1951) from the University of Minnesota Twin Cities. After working briefly at the Oak Ridge National Laboratory and in the U.S. Army, he returned to the University of Minnesota Twin Cities in 1956 to pursue a Ph.D. degree in Mechanical Engineering under the guidance of Dr. Ernst R. G. Eckert. After obtaining his doctorate (1959), Professor Goldstein had brief appointments at Brown University (1959) and the Centre National de la Recherche Scientifique as a NATO Postdoctoral Fellow (1960). He returned to the University of Minnesota Twin Cities in 1961 as an Associate Professor in the Department of Mechanical Engineering, wherein he progressively served as an Associate Professor (1961–1965), Professor (1965–1990), Department Head (1977–1997), Regents' Professor (1990–2018), and Regents and James J. Ryan Professor Emeritus (2018–2023). He had a deep passion for teaching and creating opportunities for others. During his six-decade-long academic career, he mentored 74 doctoral and 82 master's students, as well as several visiting and postdoctoral scholars.

Professor Goldstein established a very long record of service to the scientific and engineering community both domestically and internationally, including major leadership roles, such as President of the Assembly for International Heat Transfer Conferences, President of the American Society of Mechanical Engineers (ASME), and President of the International Centre for Heat and Mass Transfer (ICHMT). He served as an honorary member of the Associazione Termotecnica Italiana (2006) and as the chair of the honorary editorial advisory board for the International Journal of Heat and Mass Transfer and the International Communications in Heat and Mass Transfer for several years. Professor Goldstein's honors and recognitions include honorary doctoral degrees, visiting professorships, fellowships/memberships in prestigious professional and honorary societies, and honorary editorial advisory board memberships in esteemed journals. His distinguished contributions to the field of heat transfer were recognized through many prestigious awards, such as the ASME Heat Transfer Memorial Award (1978), the AIChE/ASME Max Jakob Memorial Award (1990), the ICHMT Luikov Medal (1990), the Nusselt–Reynolds Prize (1993), the ICHMT Fellowship Award (2004), and the ASME Medal (2006). He was also bestowed fellowships in reputed societies such as the American Association for the Advancement of Science (1986), the American Physical Society (1989), the American Society for Engineering Education (1997), the American Society of Mechanical Engineers (1999), and the Royal Academy of Engineering (1999). He was a member of the United States National Academy of Engineering (1985), the National Academy of Engineering – Mexico (1991), the European Academy of Science and Arts (2016), and the Pan American Academy of Engineering (2019). In recognition of his pioneering contributions to the field of energy, ASME established the Richard J. Goldstein Energy Lecture Award in 2019. More recently, the ICHMT established the ICHMT Hewitt–Goldstein Young Investigator Award in recognition of Geoff F. Hewitt and Richard J. Goldstein, pioneering members of the ICHMT and outstanding leaders in the field of heat transfer and energy. Professor Goldstein's most important contributions do not come with awards or medals but are felt in the hearts of the students, young faculty members, colleagues, and other acquaintances whom he mentored and otherwise influenced through their careers.

Invited Speakers:

Symposium

Sumanta Acharya, *NSF/Illinois Institute of Technology*

Arun Majumdar, *Stanford University*

Yogendra Joshi, *Georgia Institute of Technology*

Hyung Hee Cho, *Yonsei University*

Je-Chin Han with Lesley Wright, *Texas A&M University*

Suhas Patankar, *Innovative Research Inc.*

Alfonso Ortega, *Villanova University*

Ronald Adrian, *Arizona State University*

Srinath Ekkad, *North Carolina State University*

Jayathi Murthy, *Oregon State University*

John Shadid, *Sandia National Laboratories*

Chiyuki Nakamata, *IHI Corporation*

Recardo Martinas–*Botas & Matei, Imperial College London*

Sanjay Chopra, *General Electric*

John Bischof, *University of Minnesota*

Topics of Interest:

In honor of Prof. Goldstein's broad contributions to heat transfer and thermal science, the topics of this symposium encompass all areas in current and past heat transfer research.

Symposium Organizers:

Terrence Simon, *University of Minnesota Twin Cities*

Sangjo Han, *Seoul National University of Science and Technology*

Kaustubh Kulkarni, *ExxonMobil*

Umesh Madanan, *Indian Institute of Technology Kanpur*

Vinod Srinivasan, *University of Minnesota Twin Cities*

Xiaojia Wang, *University of Minnesota Twin Cities*

PROGRAM MANAGERS FUNDING PANEL

TUESDAY, JULY 16 **3:35PM–5:15PM**
CALIFORNIA BALLROOM B, BALLROOM LEVEL, SECOND FLOOR

The federal funding panel will provide the opportunity for program managers to outline their funding priorities to conference attendees.

Panelists:

Sumanta Acharya, *National Science Foundation Thermal Transport Processes*

David Haas, *Department of Energy Solar Energy Technologies Office*

Yogendra Joshi, *Defense Advanced Research Projects Agency*

Zachary Pritchard, *Department of Energy Office of Energy Efficiency and Renewable Energy, Industrial Efficiency and Decarbonization Office*

Mark Spector, *Office of Naval Research*

K8–P1: PANEL ON FUNDAMENTALS OF HEAT TRANSFER FOR CLIMATE AND SUSTAINABLE ENERGY

MONDAY, JULY 15 **1:35PM–3:35PM**
EL CAPITAN B, CONCOURSE LEVEL, FOURTH FLOOR

K8–P2: PANEL ON FUNDAMENTALS OF MACHINE LEARNING FOR HEAT TRANSFER

TUESDAY, JULY 16 **10:35AM – 12:05PM**
EL CAPITAN B, CONCOURSE LEVEL, FOURTH FLOOR

K8–P3: PANEL ON FUNDAMENTALS OF SEMICONDUCTOR THERMAL MANAGEMENT

TUESDAY, JULY 16 **1:35PM–3:35PM**
EL CAPITAN B, CONCOURSE LEVEL, FOURTH FLOOR

K20–W1: WORKSHOP ON INVERSE PROBLEMS AND PARAMETER ESTIMATION IN HEAT TRANSFER I

WEDNESDAY, JULY 17 **8:25AM–10:05AM**
EL CAPITAN A, CONCOURSE LEVEL, FOURTH FLOOR

K20–W2: WORKSHOP ON INVERSE PROBLEMS AND PARAMETER ESTIMATION IN HEAT TRANSFER II

WEDNESDAY, JULY 17 **10:25AM–12:05PM**
EL CAPITAN A, CONCOURSE LEVEL, FOURTH FLOOR

2024 Awards and Recognitions

THE 2024 AICHE/ASME MAX JAKOB MEMORIAL LECTURE

MONDAY, JULY 15 **8:00AM–9:00AM**
CALIFORNIA BALLROOM B, BALLROOM LEVEL, SECOND FLOOR

Professor Walter Grassi
DESTEC – School of Engineering
University of Pisa
Pisa, Italy

DONALD Q. KERN AWARD LECTURE

TUESDAY, JULY 16 **8:00AM–9:00AM**
CALIFORNIA BALLROOM B, BALLROOM LEVEL, SECOND FLOOR

Professor Satwindar Sadhal
Professor of Aerospace & Mechanical Engineering and Ophthalmology
University of Southern California
Los Angeles, CA

BERGLES-ROHSENOW YOUNG INVESTIGATOR AWARD IN HEAT TRANSFER

David Warsinger
Associate Professor, Purdue University
West Lafayette, IN

David Warsinger is an Assistant Professor at Purdue University, affiliated with Mechanical Engineering and the Birck Nanotechnology Center and Herrick Labs. David's research uses thermofluids and materials science for improving the performance and capabilities of sustainable membrane technologies. His applications include research for desalination, water treatment, water harvesting, heat and mass transfer in membranes, thermophoresis, and HVAC membranes. David completed his Ph.D. at MIT with John Lienhard and was a PostDoc at Yale University with Menachem Elimelech. David is a coauthor of over 110 scientific contributions, comprising journal papers, conference papers, patents, and book chapters. He has won six international awards for young scientists, such as MIT Technology Review's 35 innovators under 35, and receives over 1000 citations per year. He is also involved with commercializing his research through startup companies and industrial grants.

ASME HEAT TRANSFER MEMORIAL AWARD – SCIENCE

John C. Bischof
Professor, University of Minnesota
Minneapolis, MN

John C. Bischof's work falls within the scientific fields of thermal bioengineering including cryobiology (low temperature biology) and hyper-thermic biology, with broad application in therapeutics, regenerative medicine, and diagnostics. During his career, he has made contributions to the areas of cryosurgery, thermal and other focal therapies (i.e., irreversible electroporation) for treatment of cancer and cardiovascular disease. He has also contributed numerous strategies and methods for organ, tissue, and gamete preservation technology and biothermal property measurements. More recently, he has worked in the area of nanomedicine focusing on biodistribution and heating properties of gold and iron oxide nanoparticles for in vivo therapeutic, in vitro preservation, and diagnostic bioassay use. He is the Medtronic – Bakken Endowed Chair in Engineering in Medicine, the Distinguished McKnight University Professor in the Departments of Mechanical and Biomedical Engineering, and the inaugural Carl and Janet Kuhrmeyer Chair in Mechanical Engineering at the University of Minnesota. He obtained a B.S. in Bioengineering from U.C. Berkeley (UCB) in 1987, an M.S. from UCB and U.C. San Francisco in 1989, and a Ph.D. in Mechanical Engineering from UCB in 1992. After a Post-Doctoral Fellowship at Harvard in the Center for Engineering in Medicine, he joined the University of Minnesota in 1993.

ASME HEAT TRANSFER MEMORIAL AWARD – ART

Srinivas Garimella
Hightower Chair in Engineering
Director of the Sustainable Thermal Systems Laboratory
Georgia Institute of Technology
Atlanta, GA

Professor Srinivas Garimella is the Hightower Chair in Engineering and Director of the Sustainable Thermal Systems Laboratory at Georgia Institute of Technology. He has held prior positions as Research Scientist at Battelle Memorial Institute, Senior Engineer at General Motors Corp., and Associate Professor at Western Michigan University and Iowa State University. He conducts research in the areas of microscale phase-change heat and mass transfer, sustainable thermal systems, nuclear thermal hydraulics, thermal and electrochemical energy storage, waste heat recovery, water conservation and purification, and decarbonization. He has mentored over 75 students pursuing their M.S. and Ph.D. degrees, postdoctoral researchers and research engineers, with his research resulting in over 375 archival journal and conference publications, a textbook on Heat Transfer and Fluid Flow in Minichannels and Microchannels (2nd Ed., Elsevier 2014), and books on Condensation Heat Transfer (World Scientific Publishing, 2015) and Adsorption Heat Pumps (Springer Nature, 2021.) He has been awarded seventeen patents.

ASME HEAT TRANSFER MEMORIAL AWARD – GENERAL

Milind A. Jog
Professor, Mechanical Engineering
University of Cincinnati
Cincinnati, OH

Dr. Milind A. Jog is Professor and Associate Head in the Department of Mechanical & Materials Engineering at the University of Cincinnati (UC). Dr. Jog is renowned for his work in computational heat transfer, interfacial phenomena, atomization, and two-phase flow. He has co-authored a graduate-level textbook on Advanced Thermodynamics and holds a patent. He has received research funding of over $12M from government agencies, including NSF, NASA, NIH, DOE, ARPA-e, NIOSH, AFRL, NRC, and industries such as GE, Parker Hannifin, Babcock & Wilcox, and P&G. Dr. Jog has received numerous research awards, including the NSF CAREER Award (1998), Sigma Xi Outstanding Investigator Award (2004), UC Faculty Achievement Award (1997), and the UC Distinguished Researcher Award (2015). His teaching excellence awards include the BP-Amoco Award (2001), Robert Hundley Award Teaching (2004, 2015), and the Neil Wandmacher Award (2022). Dr. Jog is a Fellow of ASME, and he has served as an Associate Editor for the ASME Journal of Heat and Mass Transfer and for the Journal of Enhanced Heat Transfer. He chaired the 22nd Annual Conference of ILASS, the 9th ASME – ISHMT Heat and Mass Transfer Conference, 2021 ASME SHTC, 2022 ASME SHTC, and 2023 HTD Track for ASME IMECE.

JAMES S. HARRY POTTER GOLD MEDAL

Efstathios E. Michaelides,
Professor and W. A. Tex Moncrief Chair of Engineering
Texas Christian University
Fort Worth TX

Professor Stathis Michaelides currently holds the Tex Moncrief Chair of Engineering at Texas Christian University (TCU). He was awarded a B.A. degree (honors) from Oxford University and M.S. and Ph.D. degrees from Brown University. He was awarded the M.A. degree honoris causa from Oxford University (1983); the Casberg and Schillizzi Fellowships at St. Johns College, Oxford; the student chapter ASME/Phi,Beta,Tau excellence in teaching award (1991 and 2001); the Lee H. Johnson award for teaching excellence (1995) at Tulane; a Senior Fulbright Fellowship (1997); the ASME Freeman Scholar award (2002); the Outstanding Researcher award at Tulane (2003); the ASME Outstanding Service citation (2007); the ASME Fluids Engineering award (2014); the ASME 90th Anniversary of FED Medal (2016), and the ASME Edwin F. Church Medal, (2021). He has also been the Chair of the Faculty Senate at TCU (2015–2016).

Professor Michaelides has authored more than 180 journal papers, gave more than 300 presentations in national and international conferences, and has authored seven books. His book on Energy, the Environment, and Sustainability (CRC Press, 2018) has been adopted by several universities, worldwide, as a textbook in renewable energy and sustainability courses.

2024 Awards and Recognitions

GEORGE WESTINGHOUSE SILVER MEDAL

David R. Noble
Senior Program Manager, Gas Turbine R&D
Electric Power Research Institute
Charlotte, NC

David Robert Noble is the Senior Program Manager for the Gas Turbine R&D at EPRI. He is responsible for the gas turbine research area, where he and his team work on topics involving all aspects of the gas turbine system. His primary gas turbine expertise is in gas turbine combustion, with focus on combustion dynamics, hydrogen and other renewable fuels, along with next-generation, low-NOx combustor architectures. He is instrumental in gas turbine health and performance analytics developments, including digital twins.

Prior to EPRI, Mr. Noble was the Senior Research Engineer and Director, Combustion Group Business & Research Operations, in the Ben T. Zinn Combustion Laboratory in the School of Aerospace Engineering at the Georgia Institute of Technology in Atlanta, Georgia. He collaborated with OEMs and government researchers on combustion dynamics/physics, emissions, and next-generation design concepts. He also formed Noble Combustion Consulting, LLC where focus was given to field solutions for power generation gas turbine challenges.

Mr. Noble is an ASME Fellow with more than 20 years of experience in the gas turbine and power industry. He holds five patents, co-edited the book Renewable Fuels: Sources, Conversion, and Utilization, and has authored/co-authored 15+ journal publications along with 50+ conference publications.

MCDONALD MENTORING AWARD

Xiulin Ruan
Professor in the School of Mechanical Engineering and Birck Nanotechnology Center
Purdue University
West Lafayette, IN

Dr. Xiulin Ruan is a professor in the School of Mechanical Engineering and Birck Nanotechnology Center at Purdue University. He received his B.S. and M.S. in Engineering Thermophysics in 2000 and 2002, respectively, from Tsinghua University. He then received an M.S. in electrical engineering in 2006 and Ph.D. in mechanical engineering in 2007 from the University of Michigan at Ann Arbor. Subsequently, he joined Purdue faculty. His research and teaching interests are in predictive simulations, scalable manufacturing, and multiscale characterizations of thermal transport materials and systems. He has developed the general theory and computational method of four-phonon scattering, created several simulation methods including modal non-equilibrium molecular dynamics and multi-temperature model, and invented ultrawhite radiative cooling paints. Dr. Ruan received several awards, including NSF CAREER Award in 2012; Air Force Summer Faculty Fellowship in 2010, 2011, and 2013; ASME Heat Transfer Division Best Paper Award in 2015; Purdue University School of Mechanical Engineering Outstanding Engineering Graduate Student Mentor Award in 2016 and 2022; University Faculty Scholar Award in 2017; College of Engineering Research Excellence Award in 2022; Guinness World Record in 2022; South by Southwest (SXSW) Innovation Award for Sustainability in 2023; Brillouin Medal from the International Phononics Society in 2023; and ASME McDonald Mentoring Award in 2024. He is an ASME Fellow and served as an associate editor for the ASME Journal of Heat and Mass Transfer from 2018 to 2024.

SHTC 2024 features three activities dedicated to students including a Newcomers Panel and Social, Poster Presentation Competition and Career Panel. These activities will be available to all student participants at no additional cost. Stay tuned for more information.

NEWCOMER PANEL & SOCIAL

MONDAY, JULY 15 **9:05AM–10:05AM**
CORONADO ROOM, CONCOURSE LEVEL, FOURTH FLOOR

Cost: Complimentary

All first-time attendees of the Summer Heat Transfer Conference (including students) are invited to attend a panel discussion regarding how to get the most out of your first SHTC. The discussion will be followed by a brief game designed to introduce you to other first-time attendees. Refreshments will be provided.

POSTER PRESENTATION COMPETITION

MONDAY, JULY 15 **12:05PM–1:35PM**
CALIFORNIA BALLROOM C & BALLROOM LEVEL, SECOND FLOOR

Panelists:

Dr. Leslie Phinney, *Sandia*

Dr. Rydge Mulford, *University of Dayton*

Please join us to support your colleagues during this poster presentation and competition. We would like to extend our gratitude to the Heat Transfer Division for their contribution and support.

STUDENT CAREER PANEL

TUESDAY, JULY 16 **5:20PM–6:20PM**
CORONADO ROOM, CONCOURSE LEVEL, FOURTH FLOOR

Panelists:

Kevin Dowding, *Sandia*

Dr. Arum Maley, *Boeing*

Reza Baghaei Lakeh, *Cal Poly Pomona*

Hailei Wang, *Utah State University*

Members of industry, academia, and national labs will discuss their careers, how they selected the path they have taken, and answer questions from the audience about work/life balance in each respective field, etc.

CAN BE FOUND IN THE CONFERENCE APPLICATION (APP).

STUDENT POSTER COMPETITION

MONDAY, JULY 15 **12:05PM–1:35PM**
CALIFORNIA C & D, BALLROOM LEVEL, SECOND FLOOR

LAST NAME	FIRST NAME	SUBMISSION CODE	TRACK/SESSION	SUBMISSION NAME
Banthiya	Abhijeet	138005	K16 Heat Transfer in Electronic Equipment	Topology Optimization of Multi-Layer Heat Sinks
Barghi Golezani	Farshad	131474	K8 Theory and Fundamental Research	Non-linear Machine Learning Approaches for Prediction of Condensation Pressure Drops in Mini/Microchannels
Chukwunenye	Nnamdi	142184	K13 Heat Transfer in Multi-Phase Flow	Additive Manufacturing Biomimetic Structures for Pool Boiling Heat Transfer Enhancement
Crossley	Jacob	138753	K8 Theory and Fundamental Research	Molecular Dynamic Simulations of Hypersonic Solid in Rarefied Gases
Edinger	Sebastian	138695	K10 Heat Transfer Equipment	Optimization of Porous Media in a Liquid Piston Isothermal Gas Compressor/expander
Felicelli	Andrea	142456	K9 Nanoscale Thermal Transport	Biodegradable Hbn Films With Nanoplatelet Orientation for Enhanced Radiative Cooling
Giglio	Roman	138190	K13 Heat Transfer in Multi-Phase Flow	Controlled Liquid and Vapor Counterflow in Pool Boiling for Hotspot Cooling
Haque	Md Azazul	131374	K11 Fire and Combustion	Effect of Syngas Composition on Combustion Behavior in Lpm Oxy-Combustion in Model Gas Turbine Combustor
Kim	Hyewon	139306	K10 Heat Transfer Equipment	Steady-State Analysis of a Sodium Loop Heat Pipe by a One-Dimensional Design Code
Li	Jiayuan	131993	K8 Theory and Fundamental Research	Capturing Interfacial Phase-Change Physics Through a Novel Triple Concentric Flow Condensation Module
Li	Calvin Hong	135296	K13 Heat Transfer in Multi-Phase Flow	Pool Boiling Heat Transfer on Biomimetic Porous Structures
Li	Xiangyu	138557	K20 Computational Heat Transfer	Transient Inverse Heat Transfer of Multilayer Structure With Interfacial Resistance Enabled by Machine Learning
Melendez	Isabel	140380	K6 Heat Transfer in Energy Systems	Microencapsulated Phase-Change Material Composites Using Vat-Photopolymerization
Moore	Stephanie	138630	K13 Heat Transfer in Multi-Phase Flow	Deciphering the Physics of Phase-Change Heat Transfer in O (10 Micrometer) Micro Gaps
Ozkazanc Guc	Gokce	142411	K13 Heat Transfer in Multi-Phase Flow	Developing a Novel Two Phase Pore Network Algorithm for High Heat Flux Electronics Cooling Applications
Smrity	Araf Mim Ahmed	137557	K9 Nanoscale Thermal Transport	Enhancing Pulsating Heat Pipe Efficiency With Metallic and Metallic Oxide Nanoparticles Based Hybrid Nanofluids: A Comparative Study
Taylor	Calla	139875	K13 Heat Transfer in Multi-Phase Flow	Fluid Motion of Liquid Cooled Heat Sinks
Yang	Jae Sung	137159	K6 Heat Transfer in Energy Systems	A Numerical Optimization of Na-Nicl2 Battery Module Thermal Management for Energy Storage System With Multi-Step Approach

Invited Speakers

START TIME	END TIME	ROOM NAME	LAST NAME	FIRST NAME	SUBMISSION CODE	SUBMISSION NAME	TRACK/SESSION
MONDAY, JULY 15							
10:25AM	12:05PM	El Capitan A	Majumdar	Arun	144892	Scalable Chemical Reactions for Atmospheric Greenhouse Gas Removal	S01: Symposium In Memory Of Professor Richard J. Goldstein I
10:25AM	12:05PM	El Capitan A	Patankar	Suhas	138037	The Cooling Challenge in Data Centers	S01: Symposium In Memory Of Professor Richard J. Goldstein I
10:25AM	12:05PM	El Capitan A	Shadid	John	142242	On a Scalable Fully-Implicit Vms Formulation for Visco-Resistive MHD for Application to Magnetic Confinement Fusion (MCF)*, and a Brief Discussion of the Academic Lineage of R. J. Goldstein (not sure asterisk is needed here)	S01: Symposium In Memory Of Professor Richard J. Goldstein I
10:25AM	12:05PM	El Capitan B	Won	Yoonjin	139237	Fundamentals of Machine Learning for Phase Change Heat Transfer	K8-01: Fundamentals Of Machine Learning In Heat Transfer
1:35PM	3:15PM	El Capitan A	Acharya	Sumanta	142288	Impingement Cooling and Strategies for Enhancement of Impingement Heat Transfer	S02: Symposium In Memory Of Professor Richard J. Goldstein Ii
1:35PM	3:15PM	El Capitan A	Cho	Hyung Hee	137986	Enhancement of Heat Transfer in Gas Turbines Through Impingement/effusion Cooling	S02: Symposium In Memory Of Professor Richard J. Goldstein Ii
1:35PM	3:15PM	El Capitan A	Han	Je-Chin	138702	Thermal and Mass Transfer Analogy Methods for Film Cooling Measurements	S02: Symposium In Memory Of Professor Richard J. Goldstein Ii
1:35PM	3:15PM	San Simeon A	Koh	Yee Kan	138430	Mapping of Thermal Conductance of Twisted Graphene and Anisotropic Thermal Conductivity of Graphite Electrodes by Scanning Thermoreflectance	K9-02: Nanothermal Metrology

START TIME	END TIME	ROOM NAME	LAST NAME	FIRST NAME	SUBMISSION CODE	SUBMISSION NAME	TRACK/SESSION
3:35PM	5:15PM	El Capitan A	Chopra	Sanjay	142412	Gas Turbine Advancement and Evolution	S03: Symposium In Memory Of Professor Richard J. Goldstein Iii
3:35PM	5:15PM	El Capitan B	Feng	Tianli	138642	Prediction and Understanding of Thermal Transport in Crystalline Materials at Ultra-High Temperatures	K8-02: Fundamentals Of Phonons, Electrons, And Transport Properties
3:35PM	5:15PM	El Capitan A	Ignuta-Ciuncanu	Matei-Cristian	134321	Advanced Thermal Management Using a Generative Multi-Layer Approach	S03: Symposium In Memory Of Professor Richard J. Goldstein Iii
3:35PM	5:15PM	Coronado	King	William	142252	Additively Manufactured Heat Exchangers: Design, Manufacturing, and Experiments	K15-01: Additive Manufacturing And Heat Transfer
3:35PM	5:15PM	El Capitan B	Li	Deyu	132229	Exotic Nanowire Thermal Transport Properties Enabled by One-Dimensional Phonons and Polaritons	K8-02: Fundamentals Of Phonons, Electrons, And Transport Properties
3:35PM	5:15PM	El Capitan A	Nakamata	Chiyuki	142226	Film Cooling Study on Turbine Blade Endwall With Prof. Goldstein	S03: Symposium In Memory Of Professor Richard J. Goldstein Iii
3:35PM	5:15PM	El Capitan B	Tian	Zhiting	138612	Measuring Thermal Transport Using Transient Thermal Grating	K8-02: Fundamentals Of Phonons, Electrons, And Transport Properties
3:35PM	5:15PM	San Simeon A	Zhu	Yangying	142047	Probing and Manipulating Phase Change Transport Phenomena Using Light	K9-03: Tunable Thermal Transport

Invited Speakers

START TIME	END TIME	ROOM NAME	LAST NAME	FIRST NAME	SUBMISSION CODE	SUBMISSION NAME	TRACK/SESSION
TUESDAY, JULY 16							
10:25AM	12:05PM	San Simeon A	Beechem	Thomas	138610	Polaritonic Thermal Transport for Deeply Scaled Electronics	K9-04: Thermal Transport In Nanomaterials Across Interfaces I
10:25AM	12:05PM	Avila A	Li	Like	138014	Heat Transfer in Particle-Based Thermochemical Energy Storage Reactors	K6-03: Heat Transfer In Energy Systems - Energy Storage I
1:35PM	3:15PM	El Capitan A	Joshi	Yogendra	139321	Thermal Characterization of Pin-Fin-Enhanced Meso-Scale Gaps Based Two-Phase Coldplates	S05: Symposium In Memory Of Professor Richard J. Goldstein V
1:35PM	3:15PM	El Capitan A	Murthy	Jayathi	142356	Sensitivity Analysis and Automatic Code Differentiation for Thermal and Fluid Transport Applications	S05: Symposium In Memory Of Professor Richard J. Goldstein V
1:35PM	3:15PM	El Capitan A	Ortega	Alfonso	142204	From Convective Heat Transfer With Air to Two-Phase Heat Transfer With Refrigerants: An Academic Journey Through Electronics Cooling in Honor of Prof. Richard J. Goldstein	S05: Symposium In Memory Of Professor Richard J. Goldstein V
1:35PM	3:15PM	Coronado	Pan	Liang	130827	Nanoscale 3D Printing Based on Nonlinear Radical Conversion and Transport	K15-03: Laser And Optical Manufacturing
3:35PM	5:15PM	San Simeon A	Acosta	Greg	138378	Characterization of Temperature-Driven Forces in Rarefied Gas-Solid Systems	K9-06: Thermal Transport In Nanomaterials Across Interfaces Ii
3:35PM	5:15PM	El Capitan A	Adrian	Ronald	142819	Patterns and Processes in Turbulent Rayleigh-Benard Convection	S06: Symposium In Memory Of Professor Richard J. Goldstein Vi
3:35PM	5:15PM	El Capitan A	Bischof	John	139874	Bioheat Transfer and Biopreservation	S06: Symposium In Memory Of Professor Richard J. Goldstein Vi

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3:35PM	5:15PM	El Capitan A	Ekkad	Srinath	138098	Gas Turbine Heat Transfer Measurement Methods	S06: Symposium In Memory Of Professor Richard J. Goldstein Vi
3:35PM	5:15PM	El Capitan B	Kharangate	Chirag	142633	Development of Novel Machine Learning Approaches to Understanding and Predicting Flow Boiling Thermal Transport	K8-03: Fundaments Of Multi-Physics Transport And Machine Learning
WEDNESDAY, JULY 17							
8:25AM	10:05AM	San Simeon A	Wang	Xiaojia	142154	Understanding and Tailoring Thermal Transport in Perovskite Oxides	K9-07: Thermal Transport In Nanomaterials Across Interfaces Iii

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Acharya	Sumanta	142288	Impingement Cooling and Strategies for Enhancement of Impingement Heat Transfer	S02: Symposium In Memory Of Professor Richard J. Goldstein Ii	Monday, July 15
Acharya	Sumanta	142289	Perspectives on Machine Learning for Thermal Science Applications	K8-P2: Panel On Fundamentals Of Machine Learning For Heat Transfer	Tuesday, July 16
Acosta	Greg	138378	Characterization of Temperature-Driven Forces in Rarefied Gas-Solid Systems	K9-06: Thermal Transport In Nanomaterials Across Interfaces Ii	Tuesday, July 16
Adhikari	Daksh	121705	Machine Learning Algorithm for Predicting Heat Transfer Coefficient and Pressure Drop in Dimpled Ducts	K20-01: Applications Of Machine Learning/ Ai For Heat Transfer	Monday, July 15
Adhikari	Daksh	130519	Rapid Cooling Technology for Extreme Sample Environment Neutron Vacuum Furnaces	K18/K19-01: Extreme Condition And Environmental Heat And Mass Transfer	Monday, July 15
Adrian	Ronald	142819	Patterns and Processes in Turbulent Rayleigh-Benard Convection	S06: Symposium In Memory Of Professor Richard J. Goldstein Vi	Tuesday, July 16
Agonafer	Damena	142190	Challenges and Opportunities for Thermal Management of Heterogenous Integrated Systems	K8-P3: Panel On Fundamentals Of Semiconductor Thermal Management	Tuesday, July 16
Aguilar	Guillermo	131007	Towards the Integration of Non-Invasive Optical Tools for Thermodynamic In-Situ Analysis of Cryopreserved Artemia Embryos During Nano Laser Rewarming.	K17-01: Heat And Mass Transfer In Biotechnology	Wednesday, July 17
Aider	Youssef	131414	"Enhanced Heat Transfer Through Additively Manufactured Architectured Lattice Frame Materials in SS316L and Ti-6Al-4V"	K10-01: Single-Phase Enhanced Heat Transfer Equipment	Monday, July 15
Al-Ameri	Bakir	142418	Near-Field Enhanced Solid-State Thermionic Energy Conversion for Waste Heat Harvesting	K9-01: Radiative Thermal Energy Conversion With Nanostructures	Monday, July 15
Aldeia Machado	Luiz	130465	Temperature Field Reconstruction of Surfaces Heated Through Radiative Heat Transfer Using Convolutional Neural Networks	K20-01: Applications Of Machine Learning/ Ai For Heat Transfer	Monday, July 15
Al-Fazari	Mohamed	121824	Improve Fuel Gas Thermal Efficiency of Once Through Steam Generator (OTSG)	K11-01: Fire And Combustion I	Monday, July 15

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Ali	Mohamed Ibrahim	131608	Exploring the Energy and Exergy Performance of an Integrated Heat Recovery System in Aluminum Smelters Using a Parallel Two-Stage Organic Rankine Cycle	K6-05: Heat Transfer In Energy Systems - Energy Storate Iii	Tuesday, July 16
Alsharif	Mohamed	122551	Measurements of Heat Transfer in Flowing Granular Media	K7-02: Thermophysical Properties Ii	Wednesday, July 17
Alvarez	Gustavo	142218	Reducing the Effective Thermal Boundary Resistance of Diamond-on-Aln	K9-08: Thermal Transport In Nanomaterials Across Interfaces Iv	Wednesday, July 17
Aly	Omar Deyab	130531	Effect of Blowing Ratio on the Film Cooling Effectiveness on a Flat Plate With Various Blockage Ratios	K14-01: Gas Turbine Heat Transfer	Wednesday, July 17
Amano	Ryo	130444	Study of Liquid Breakup Process in Solid Fuel Booster Rocket Chamber	K12-02: Aerospace Heat Transfer Ii	Monday, July 15
Arnow	Hannah	121281	Modeling Periodic Asymmetric Light Transmitting Nanostructures for Luminescent Solar Concentrators Using COMSOL Multiphysics Wave Optics Module	K9-05: Radiative Cooling And Radiative Properties Of Nanomaterials	Tuesday, July 16
Arumugam	Aanandsundar	130983	Investigation of Liquid Cooling for Lithium-Based Batteries in Phase Change Materials Using Metal Foams: A Numerical Approach	K6-06: Heat Transfer In Energy System - Components I	Wednesday, July 17
Babb	Patrick	130345	Salt-Rejecting Continuous Passive Solar Thermal Desalination via Convective Flow and Thin-Film Condensation	K13-03: Enhanced Condensation Heat Transfer	Tuesday, July 16
Bahadur	Vaibhav	142461	Translating Heat Transfer Knowledge to Mass Transfer for Climate and Sustainability	K8-P1: Panel On Fundamentals Of Heat Transfer For Climate And Sustainable Energy	Monday, July 15
Banthiya	Abhijeet	138005	Topology Optimization of Multi-Layer Heat Sinks	Student Poster Competition	Monday, July 15
Barghi Golezani	Farshad	131474	Non-linear Machine Learning Approaches for Prediction of Condensation Pressure Drops in Mini/Microchannels	Student Poster Competition	Monday, July 15
Barghi Golezani	Farshad	131476	Machine Learning Algorithms for Predicting Condensation Pressure Drop in Mini/Micro Channels	K8-01: Fundamentals Of Machine Learning In Heat Transfer	Monday, July 15
Bartlett	Maxwell	137563	Analysis of Effective Thermal Conductivity and Tortuosity in Triply Periodic Minimal Surface Foam Structures	K20-04: Applications In Computational Heat Transfer Ii	Tuesday, July 16

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Bates	Jakob G.	124316	Multifidelity Uncertainty Quantification for Focused Ultrasound Breast Cancer Therapies Using Reduced Order Models	K17-01: Heat And Mass Transfer In Biotechnology	Wednesday, July 17
Beechem	Thomas	138610	Polaritonic Thermal Transport for Deeply Scaled Electronics	K9-04: Thermal Transport In Nanomaterials Across Interfaces I	Tuesday, July 16
Bischof	John	139874	Bioheat Transfer and Biopreservation	S06: Symposium In Memory Of Professor Richard J. Goldstein Vi	Tuesday, July 16
Bohm	Preston	137910	Understanding Water Evaporation Under Visible Light Illumination	K8-03: Fundaments Of Multi-Physics Transport And Machine Learning	Tuesday, July 16
Bunt	Brandon	131904	Improvement of a Low-Cost Apparatus for Measuring Thermal Conductivities of Solids at Steady-State	K7-01: Thermophysical Properties I	Tuesday, July 16
Bunt	Brandon	131982	Measuring Thermal Conductivity of Mycelium-Based Thermal Insulation Materials Produced With Locally Available Organic Waste Products As Substrate	K7-01: Thermophysical Properties I	Tuesday, July 16
Burdett	Timothy	130526	Heat Transfer Coefficients and Film Cooling Effectiveness on the Endwall of a Transonic Turbine Vane Measured With Binary Pressure Sensitive Paint	K14-01: Gas Turbine Heat Transfer	Wednesday, July 17
Burnett	Tage T.	130194	Analysis of Approximations in Thermal Diffusivity Measurements Using High Fidelity Simulations	K7-01: Thermophysical Properties I	Tuesday, July 16
Cao	Jiahui	129372	Thermal Transport Mechanisms in Lunar Regolith at Low and High Temperatures	K7-02: Thermophysical Properties Ii	Wednesday, July 17
Caratenuto	Andrew	138153	Critically Evaluating Dark Environment Evaporation Method of Water Enthalpy Characterization	K6-02: Heat Transfer In Energy Systems - Alternative Power Generation Ii	Monday, July 15
Caratenuto	Andrew	138479	Transforming Biocompatible Nanofibers Into a Passive Radiative Cooling Paint	K6-07: Heat Transfer In Energy System - Components Ii	Wednesday, July 17
Castaneda	Alexander J.	131411	Heat Transfer Characteristics of Oscillating Electrohydrodynamic Liquid Flow	K12-01: Aerospace Heat Transfer I	Monday, July 15

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Challise	Divya	138647	Simultaneous Time Resolved Heat Generation and Temperature Measurement: Inverse Battery Calorimetry	K6-05: Heat Transfer In Energy Systems - Energy Storate Iii	Tuesday, July 16
Chate	Akshay	131082	Effect of Reactor Configuration on the Performance of a Closed Thermochemical Energy Storage System	K6-04: Heat Transfer In Energy Systems - Energy Storate Ii	Tuesday, July 16
Chen	Leitao	131124	An Unstructured Discrete Boltzmann Model for Pure Diffusion Problems With Different Boundary Conditions	K20-06: Methods In Computational Heat Transfer	Wednesday, July 17
Cho	Hyung Hee	137986	Enhancement of Heat Transfer in Gas Turbines Through Impingement/effusion Cooling	S02: Symposium In Memory Of Professor Richard J. Goldstein Ii	Monday, July 15
Choi	Yoora	138570	A Study on the Heat Dissipation Characteristics of the Cooling System of Pem Fuel Cells for Vehicles	K6-07: Heat Transfer In Energy System - Components Ii	Wednesday, July 17
Choi	Hyeonmin	142259	Observation of Pool Boiling Behaviors on a Wire by a High-Precision Distributed Temperature Sensing Technique	K8-06: Fundamentals Of Boiling/ Condensation Including Micro/ Nanoscale Effects Ii	Wednesday, July 17
Chopra	Sanjay	142412	Gas Turbine Advancement and Evolution	S03: Symposium In Memory Of Professor Richard J. Goldstein Iii	Monday, July 15
Chukwunenye	Nnamdi	142184	Additive Manufacturing Biomimetic Structures for Pool Boiling Heat Transfer Enhancement	Student Poster Competition	Monday, July 15
Cooper	Thomas	131219	Heat Transfer Performance of Advanced Polymer Glazing Systems for Solar Thermal and Building Envelope Applications	K6-06: Heat Transfer In Energy System - Components I	Wednesday, July 17
Cooper	Thomas	133350	Direct Monte Carlo Simulation of Conjugate Heat Transfer	K20-06: Methods In Computational Heat Transfer	Wednesday, July 17
Croce	Giulio	131333	Numerical Analysis of Surface Coatings Performances for In-Flight Icing Device Performance Enhancement	K12-01: Aerospace Heat Transfer I	Monday, July 15
Crossley	Jacob	138753	Molecular Dynamic Simulations of Hypersonic Solid in Rarefied Gases	Student Poster Competition	Monday, July 15
Crossley	Jacob	138592	Molecular Dynamic Study of Gas Thermal Conductivity Across the Knudsen Regimes at Multiple Temperatures	K9-06: Thermal Transport In Nanomaterials Across Interfaces Ii	Tuesday, July 16

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Da Silva	Ramon Peruchi Pacheco	130949	Flow Measurement Through Machine Learning: A Novel Non-Intrusive Volumetric Flow Meter	K20-01: Applications Of Machine Learning/ Ai For Heat Transfer	Monday, July 15
Dai	Lingyun	138703	Heat Transfer in Twisted Van Der Waals Materials	K9-04: Thermal Transport In Nanomaterials Across Interfaces I	Tuesday, July 16
Darabi	Jeff	131119	Enhancing Thermal Performance in a PCM Heatsink Assembly by Incorporating Fins and Copper Oxide Nanoparticles	K16-03: Heat Transfer In Electronic Equipment Iii	Wednesday, July 17
Dhillon	Navdeep Singh	130879	Generation of Controlled Single Bubbles for Phenomenological Study of Nucleate Boiling Using a Dual-Lens Laser Spot Heating Approach	K8-05: Fundamentals Of Boiling/ Condensation Including Micro/ Nanoscale Effects I	Wednesday, July 17
Dipto	Mohammed Jubair	137659	Jet Fuel Oxidation on Metal Additively Manufactured Tubes	K12-02: Aerospace Heat Transfer Ii	Monday, July 15
Dowding	Kevin	138691	Parameter Estimation: Concepts and Methods	K20-W1: Workshop On Inverse Problems And Parameter Estimation In Heat Transfer I	Wednesday, July 17
Dowding	Kevin	138694	Overview of ASME V&V 20-2009, Standard for Verification and Validation in Computational Fluid Dynamics and Heat Transfer	K20-06: Methods In Computational Heat Transfer	Wednesday, July 17
Duggirala	Vyas	130976	CFD Modeling of End Effects of Gas Cooler Heat Exchanger for sCO2 Power Blocks	K10-03: Multi-Scale Multi-Phase Heat Transfer Equipment Ii	Wednesday, July 17
Dunn	Anthony	131042	Review of Thermal Cooling of EV Batteries With Heat Pipes	K16-01: Heat Transfer In Electronic Equipment I	Tuesday, July 16
Dutta	Dip	138213	High-Performance Solid-State Heat Engine Enabled by Radiative Thermal Switching	K6-09: Heat Transfer In Energy Systems - Waste Heat Ii	Wednesday, July 17
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Edinger	Sebastian	138693	Simulation of Liquid Piston, High Temperature Stirling Cycle Heat Pumps	K6-09: Heat Transfer In Energy Systems - Waste Heat Ii	Wednesday, July 17

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Ersoy	Ahmet Ata	131409	Molecular Dynamics Investigations of a Steady-State Net Condensing Surface	K9-06: Thermal Transport In Nanomaterials Across Interfaces Ii	Tuesday, July 16
Farouk	Bakhtier	131523	Thermoelectric Waste Heat Recovery in a Concentric Tube Silencer for Automotive System	S04: Symposium In Memory Of Professor Richard J. Goldstein Iv	Tuesday, July 16
Farouk	Bakhtier	132132	Pyrolysis and Heat Release Rate Predictions of Heated Solid Specimens in the OSU Apparatus	K11-01: Fire And Combustion I	Monday, July 15
Felicelli	Andrea	142456	Biodegradable Hbn Films With Nanoplatelet Orientation for Enhanced Radiative Cooling	Student Poster Competition	Monday, July 15
Felicelli	Andrea	138806	Structural Radiative Cooling in Highly Reflective White Snail Shells as Adaptation to Extreme Heat Environments	K9-05: Radiative Cooling And Radiative Properties Of Nanomaterials	Tuesday, July 16
Feng	Tianli	138642	Prediction and Understanding of Thermal Transport in Crystalline Materials at Ultra-High Temperatures	K8-02: Fundamentals Of Phonons, Electrons, And Transport Properties	Monday, July 15
Feser	Joseph	142443	Thermal Transport Across Epitaxial Nialga/gaas Interfaces	K9-06: Thermal Transport In Nanomaterials Across Interfaces Ii	Tuesday, July 16
Fogel	Rutledge	131359	Numerical Heat Transfer Analysis of NACA Pin-Fin Thickness	K14-01: Gas Turbine Heat Transfer	Wednesday, July 17
Gaitonde	Aalok	138627	Characterizing Thermal Resistance Across Deeply Buried Interfaces in Advanced Semiconductor Packages	K7-01: Thermophysical Properties I	Tuesday, July 16
Gaudio	Philip	132685	Transport and Flow Characteristics of Graphene-Doped Nanofluids at Moderate Temperatures in Double-Pipe Heat Exchangers	K9-08: Thermal Transport In Nanomaterials Across Interfaces Iv	Wednesday, July 17
Ge	Wenjun	130666	"Modeling Microwave-Enhanced Chemical Vapor Infiltration Process for Preventing Premature Pore Closure"	K15-03: Laser And Optical Manufacturing	Tuesday, July 16
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Golia	Maria Rita	131313	Numerical Analysis Comparing the Thermal Performance of Two Solar Chimneys Combined With Thermal Energy Storage Made of Phase Change Materials Embedded in a Metal Foam	K6-04: Heat Transfer In Energy Systems - Energy Storate Ii	Tuesday, July 16
Greff	Andrew	138623	Modeling System-Level Heat Transfer in Automotive Components Using Simscape	K6-07: Heat Transfer In Energy System - Components Ii	Wednesday, July 17
Guerfi	Djamel Eddine	121973	Comprehensive Analysis of Critical Heat Flux and Heat Transfers in a Confined Jet Impingement Boiling Cooling System	K13-01: Flow Boiling In Mini/Microchannels	Monday, July 15
Guo	Songtao	142314	Effect of Pressure on Iso-Butanol Combustion	K11-02: Fire And Combustion Ii	Monday, July 15
Habibzadeh	Mehran	138607	Experimental Demonstration of Enhanced Near-Field Radiative Heat Transfer Using Graphene	K9-03: Tunable Thermal Transport	Monday, July 15
Habibzadeh	Mehran	138678	Optimized Near-Field Thermophotovoltaic Designs for Large Power Output and Efficiency	K9-01: Radiative Thermal Energy Conversion With Nanostructures	Monday, July 15
Han	Je-Chin	138702	Thermal and Mass Transfer Analogy Methods for Film Cooling Measurements	S02: Symposium In Memory Of Professor Richard J. Goldstein Ii	Monday, July 15
Han	Je-Chin	131091	Recent Advancements in the Pressure Sensitive Paint (PSP) Technique for Film Cooling Effectiveness Measurements	S04: Symposium In Memory Of Professor Richard J. Goldstein Iv	Tuesday, July 16
Haque	Md Azazul	131374	Effect of Syngas Composition on Combustion Behavior in LPM Oxy-Combustion in Model Gas Turbine Combustor	Student Poster Competition	Monday, July 15
Hardy	Devon	131404	Simulation of Supercritical Fluids With Reduced Domains In Horizontal Flows	K20-03: Applications Of Computational Heat Transfer I	Tuesday, July 16
Haustein	Herman	139070	Annular Flow Theory Revisited: Insights for Micro and Compact Heat Exchangers	K8-04: Fundamentals Of Thermal Transport In Porous Media And Single-Phase Convection	Wednesday, July 17
Hodges	Wyatt	139028	Measuring Thermal Boundary Conductance of Subsurface and Angled Interfaces	K9-04: Thermal Transport In Nanomaterials Across Interfaces I	Tuesday, July 16

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Hridoy	Shadman	138557	Transient Inverse Heat Transfer of Multilayer Structure With Interfacial Resistance Enabled by Machine Learning	Student Poster Competition	Monday, July 15
Hu	Yongjie	142364	Advancing Thermal Management With Ultra-High Thermal Conductivity Materials and Dynamic Controls	K8-P3: Panel On Fundamentals Of Semiconductor Thermal Management	Tuesday, July 16
Huntington	Richard	130602	Alternative Design of Heat Exchange Systems Improves Power Plant Safety, Operability, Reliability, Cycle Efficiency, and Economics	K6-01: Heat Transfer In Energy Systems - Alternative Power Generation I	Monday, July 15
Hwang	Wontae	130468	Experimental and Numerical Investigation of the 3-D Flow Structure in a Network of Lattice Cooling Channels for a Gas Turbine Blade	K14-01: Gas Turbine Heat Transfer	Wednesday, July 17
Ignuta-Ciuncanu	Matei-Cristian	134321	Advanced Thermal Management Using a Generative Multi-Layer Approach	S03: Symposium In Memory Of Professor Richard J. Goldstein Iii	Monday, July 15
Inanlu	Mohammad Jalal	138193	Enhanced Refrigerant Flow Boiling on Scalable Micro- and Nanostructured Copper Surfaces: In-Situ Boroscopy Insights	K13-04: Liquid-To-Vapor Phase-Change At Enhanced Surfaces	Wednesday, July 17
Irace	Phillip	138066	Spherical Cool Diffusion Flames of Gaseous Fuels in Microgravity	K11-02: Fire And Combustion Ii	Monday, July 15
Irick	Kevin	138742	Trusting Computational Models	K20-06: Methods In Computational Heat Transfer	Wednesday, July 17
Islam	Md.	131114	Two-Degrees of Freedom Flow-Induced Vibrations and Heat Transfer of Twin Cylinders in Tandem and Staggered Arrangements	K20-03: Applications Of Computational Heat Transfer I	Tuesday, July 16
Islam	Md.	131116	Flow and Heat Transfer Characteristics in Arrays of Stationary and Elastically Supported Cylinders	K6-06: Heat Transfer In Energy System - Components I	Wednesday, July 17
Ispir	Ali Can	122272	Digital Twin Development of a R134a Plate-Tube Evaporator	K6-08: Heat Transfer In Energy Systems - Waste Heat I	Wednesday, July 17
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Jennings	Darryl	142268	Analysis of Large-Scale Isothermal Compressed Air Energy Storage (ICAES) System With Water Droplets	K6-05: Heat Transfer In Energy Systems - Energy Storate Iii	Tuesday, July 16
Jervis	Freddy	131355	Design of Test Bench for the Analysis of Efficiency and Effectiveness of Extended Surfaces for Educational Purpose	K10-01: Single-Phase Enhanced Heat Transfer Equipment	Monday, July 15
Joshi	Yogendra	139321	Thermal Characterization of Pin-Fin-Enhanced Meso-Scale Gaps Based Two-Phase Coldplates	S05: Symposium In Memory Of Professor Richard J. Goldstein V	Tuesday, July 16
Kang	Sukkyung	137818	Thermal Performance Enhancement of Two-Phase Closed Thermosyphon With Sandblasted Evaporator	K10-03: Multi-Scale Multi-Phase Heat Transfer Equipment Ii	Wednesday, July 17
Karki	Kailash	131384	Prediction of Airflow and Temperature Distribution in Data Centers With Focus on Containments	S04: Symposium In Memory Of Professor Richard J. Goldstein Iv	Tuesday, July 16
Katsamba	Ioanna	142391	Significance of Nanostructure and Morphology in Radiative Cooling Nanocomposites	K9-05: Radiative Cooling And Radiative Properties Of Nanomaterials	Tuesday, July 16
Kharangate	Chirag	142633	Development of Novel Machine Learning Approaches to Understanding and Predicting Flow Boiling Thermal Transport	K8-03: Fundaments Of Multi-Physics Transport And Machine Learning	Tuesday, July 16
Khodakarami	Siavash	142624	Infrared Thermography Characterization of Pure Steam Condensation	K8-06: Fundamentals Of Boiling/ Condensation Including Micro/ Nanoscale Effects Ii	Wednesday, July 17
Kim	Hyewon	139306	Steady-State Analysis of a Sodium Loop Heat Pipe by a One-Dimensional Design Code	Student Poster Competition	Monday, July 15
King	William	142252	Additively Manufactured Heat Exchangers: Design, Manufacturing, and Experiments	K15-01: Additive Manufacturing And Heat Transfer	Monday, July 15
Kinzel	Edward	130943	Distributed Single-Mode Optical Fiber High Temperatures Measurements	K15-03: Laser And Optical Manufacturing	Tuesday, July 16
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Kocher	Jordan	137355	Thermal Storage Cost Scaling Analysis to Determine Storage Material Figures of Merit	K6-04: Heat Transfer In Energy Systems - Energy Storate Ii	Tuesday, July 16
Koh	Yee Kan	138430	Mapping of Thermal Conductance of Twisted Graphene and Anisotropic Thermal Conductivity of Graphite Electrodes by Scanning Thermoreflectance	K9-02: Nanothermal Metrology	Monday, July 15
Koh	Yee Kan	138590	Thermal Conductance of Buried Interfaces Measured by Dual-Frequency Differential Time-Domain Thermoreflectance	K9-08: Thermal Transport In Nanomaterials Across Interfaces Iv	Wednesday, July 17
Kriz	Adam	138513	Characterizing Thin Liquid Films Formation and Evaporation in Microchannel Flow Boiling	K8-07: Fundamentals Of Boiling/ Condensation Including Micro/ Nanoscale Effects Iii	Wednesday, July 17
Ladeinde	Foluso	130289	Comparative Thermal-Hydraulic Performance of Twelve Heat Exchanger Devices	K10-01: Single-Phase Enhanced Heat Transfer Equipment	Monday, July 15
Lee	Ming-Tsang	138472	Laser Induced Recast of Nanoporous Carbonized Micro-via on Polymer Thin Film	K15-03: Laser And Optical Manufacturing	Tuesday, July 16
LI	Deyu	132229	Exotic Nanowire Thermal Transport Properties Enabled by One-Dimensional Phonons and Polaritons	K8-02: Fundamentals Of Phonons, Electrons, And Transport Properties	Monday, July 15
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Li	Calvin Hong	135299	Experimental Investigation of Water Evaporation on Porous Media With Metallic Oxides Coatings by Atomic Layer Deposition	K13-04: Liquid-To-Vapor Phase-Change At Enhanced Surfaces	Wednesday, July 17
Li	Calvin Hong	135301	Aggregation Mechanisms of Iron Oxide Nanoparticle on a Silicon Nitride Ceramic Substrate Under External Electrical Field	K15-02: Transport Phenomena In Manufacturing	Tuesday, July 16
Li	Jiayuan	131027	Prediction of Critical Heat Flux for Liquid Helium Using Machine Learning Models Assisted by Physics-Based Correlation	K8-01: Fundamentals Of Machine Learning In Heat Transfer	Monday, July 15
Li	Jiayuan	131993	Capturing Interfacial Phase-Change Physics Through a Novel Triple Concentric Flow Condensation Module	Student Poster Competition	Monday, July 15

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Li	Suixuan	138696	Exploring High-Order Phonon Physics Through High-Pressure Thermal Transport	K9-02: Nanothermal Metrology	Monday, July 15
Li	Tao	138026	A Complex Thermal Conductivity to Model Ballistic Phonon Transport Under Periodic Heating	K9-09: Nanoscale Thermal Transport Modeling And Machine Learning I	Wednesday, July 17
Li	Wei	130419	Carbon Emission Model of Power Industry Based on Life Cycle Perspective in China	K6-01: Heat Transfer In Energy Systems - Alternative Power Generation I	Monday, July 15
Li	Wei	130564	Effectiveness of Multi Baffles With Trefoils on the Performance of Shell and Tube Heat Exchanger	K20-03: Applications Of Computational Heat Transfer I	Tuesday, July 16
Li	Xiangyu	138524	High-Performance Atmospheric Water Harvester Design Driven by Waste Heat	K13-02: Evaporation And Pool Boiling From Enhanced Surfaces	Tuesday, July 16
Li	Xiangyu	138554	Solar-Driven High Performance Evaporator Enabled by Natural Convection With Salt Rejecting Capability	K13-02: Evaporation And Pool Boiling From Enhanced Surfaces	Tuesday, July 16
Lim	Hyewon	142022	Development of a Liquid Level Indicator Using a Distributed Fiber Optic Sensor by Thermal Capacity Differences	K10-03: Multi-Scale Multi-Phase Heat Transfer Equipment Ii	Wednesday, July 17
Liu	Xiaojie	138504	Low-Emittance Colorful Paints With Conductive Polymer Coating for Year-Round Energy-Efficient Buildings	K9-01: Radiative Thermal Energy Conversion With Nanostructures	Monday, July 15
Lorente	Sylvie	130286	Liquid Cooling of Li-Ion Cells Based on a Constructal Canopy-to-Canopy Approach	K16-01: Heat Transfer In Electronic Equipment I	Tuesday, July 16
Lu	Ming-Chang	137394	Droplets Impacting on Superheated Surfaces With Asymmetric Re-Entrant Microgrooves	K8-07: Fundamentals Of Boiling/ Condensation Including Micro/ Nanoscale Effects Iii	Wednesday, July 17
Luo	Jiajian	122922	Thermal Management of SOI-Based Devices Using Holey Silicon-Based Lateral Thermoelectric Cooler	K16-01: Heat Transfer In Electronic Equipment I	Tuesday, July 16
Luo	Tengfei	141747	Machine Learning With Limited Data for Thermal Transport	K8-P2: Panel On Fundamentals Of Machine Learning For Heat Transfer	Tuesday, July 16

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Majumdar	Arun	144892	Scalable Chemical Reactions for Atmospheric Greenhouse Gas Removal	S01: Symposium In Memory Of Professor Richard J. Goldstein I	Monday, July 15
Marconnet	Amy	130939	Thermal Engineering of Materials for Advanced Electronics Packaging	K8-P3: Panel On Fundamentals Of Semiconductor Thermal Management	Tuesday, July 16
Mazumder	Sandip	131125	Simulation of Time-Domain Thermo-Reflectance Experiments Using the Anisotropic Fourier Heat Conduction Equation and the Phonon Boltzmann Transport Equation	K9-09: Nanoscale Thermal Transport Modeling And Machine Learning I	Wednesday, July 17
Mazumder	Sandip	142152	Radiative Heat Transfer: The Bridge Connecting Rising Greenhouse Gases With Rising Global Temperature	K8-P1: Panel On Fundamentals Of Heat Transfer For Climate And Sustainable Energy	Monday, July 15
McMasters	Robert	121595	Determining the Thermal Properties of Insulating Material Intended for Steering Plasma Beams	K7-02: Thermophysical Properties Ii	Wednesday, July 17
Meenakshi Sundaram	Naarendharan	138016	Flash Boiling of Water-Methanol Mixtures in a Microchannel Cooler	K13-01: Flow Boiling In Mini/Microchannels	Monday, July 15
Mehmadagic	Igbal	122193	Modeling and Simulation of Aerodynamic Nosecone Ablation	K18/K19-01: Extreme Condition And Environmental Heat And Mass Transfer	Monday, July 15
Melendez	Isabel	140380	Microencapsulated Phase-Change Material Composites Using Vat-Photopolymerization	Student Poster Competition	Monday, July 15
Michna	Gregory	130686	Thermal Conductivity of Advanced 3D Printed Polymers	K7-01: Thermophysical Properties I	Tuesday, July 16
Miranda Manon	Andres	138530	Heat Transfer and Solar Capture in Linear Solar Aerogel Receivers	K6-02: Heat Transfer In Energy Systems - Alternative Power Generation Ii	Monday, July 15
Mirgolbabaei	Hessam	136446	Geometric Anomalies and Nanofluid Influence in Helically Coiled Tube Compact Heat Exchangers: Unraveling the Irregularities	K20-04: Applications In Computational Heat Transfer Ii	Tuesday, July 16
Mofidipour	Ehsan	138638	Modeling Emission From a Cavity With a Non-Uniform Surface Temperature Profile	K6-02: Heat Transfer In Energy Systems - Alternative Power Generation Ii	Monday, July 15

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Momayez	Ladan	131457	Examining the Symmetry of a Turbulent Wake Arising From Asymmetric Turbulent Shear Layers: An Experimental and Analytical Study	K12-01: Aerospace Heat Transfer I	Monday, July 15
Monga	Deepak	138573	Physics-Informed Design of Surfaces for Rolling Droplets to Enhance Condensation	K8-06: Fundamentals Of Boiling/ Condensation Including Micro/ Nanoscale Effects Ii	Wednesday, July 17
Moore	Stephanie	138630	Deciphering the Physics of Phase-Change Heat Transfer in O (10 Micrometer) Micro Gaps	Student Poster Competition	Monday, July 15
Morgan	Karl	140383	Synthesis of Microencapsulated Phase-Change Materials for Additively Manufactured Thermal Energy Storage Devices	K6-05: Heat Transfer In Energy Systems - Energy Storate Iii	Tuesday, July 16
Mulford	Rydge	131111	The Variation of Radiative Heat Loss as a Function of Actuation Angle for an Isothermal Square Twist Origami Radiator	K6-08: Heat Transfer In Energy Systems - Waste Heat I	Wednesday, July 17
Murthy	Jayathi	142356	Sensitivity Analysis and Automatic Code Differentiation for Thermal and Fluid Transport Applications	S05: Symposium In Memory Of Professor Richard J. Goldstein V	Tuesday, July 16
Nabi	Syed Arafun	131509	Optimization of a Hybrid Thermal Protection System for Space Vehicles	K20-04: Applications In Computational Heat Transfer Ii	Tuesday, July 16
Najafi	Hamidreza	138688	Inverse Heat Conduction Problem: Filter Form Solution and Machine Learning Techniques	K20-W2: Workshop On Inverse Problems And Parameter Estimation In Heat Transfer Ii	Wednesday, July 17
Najafpour	Sahand	131195	Assessment of Optimal Fin Structure and Shroud Size in Fan-Cooled Heat Sinks for Next-Generation EV Battery Chargers	K16-02: Heat Transfer In Electronic Equipment Ii	Wednesday, July 17
Najafpour	Sahand	122676	Dynamics and Thermal Performance of Inverted Flags Attached to Cylindrical Tubes in Axial Flow	K10-01: Single-Phase Enhanced Heat Transfer Equipment	Monday, July 15
Nakamata	Chiyuki	142226	Film Cooling Study on Turbine Blade Endwall With Prof. Goldstein	S03: Symposium In Memory Of Professor Richard J. Goldstein Iii	Monday, July 15

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Nasef	Ziad	122016	Powering a TLUD Biomass Pyrolyzer Using its Own Waste Heat and Thermoelectric Devices	K6-08: Heat Transfer In Energy Systems - Waste Heat I	Wednesday, July 17
Niazi	Soroush	132241	Choked Gas and Liquid Carbon Dioxide Flow Through Microchannels With Parallel Multi Orifices	K8-03: Fundaments Of Multi-Physics Transport And Machine Learning	Tuesday, July 16
Nonino	Carlo	137720	Energy Storage in PCM Impregnated Cellular Structures Obtained by Additive Manufacturing Techniques: A Performance Comparison	K15-01: Additive Manufacturing And Heat Transfer	Monday, July 15
Ortega	Alfonso	142204	From Convective Heat Transfer With Air to Two-Phase Heat Transfer With Refrigerants: An Academic Journey Through Electronics Cooling in Honor of Prof. Richard J. Goldstein	S05: Symposium In Memory Of Professor Richard J. Goldstein V	Tuesday, July 16
Owens	Charles	130699	Analytical and Numerical Modeling of Thermal Transport in Liquid Hydrogen Tanks	K6-03: Heat Transfer In Energy Systems - Energy Storage I	Tuesday, July 16
Ozkazanc Guc	Gokce	125237	Reduced Order Design Optimization Model of Ribbed Channels Based on Pressure Drop and Heat Transfer	K20-05: Applications Of Computational Heat Transfer Iii	Tuesday, July 16
Ozkazanc Guc	Gokce	130056	Estimation of Evaporative Heat Transfer Coefficient by Pore Network Modeling in the Boiling Regime	K13-04: Liquid-To-Vapor Phase-Change At Enhanced Surfaces	Wednesday, July 17
Ozsipahi	Mustafa	130657	Molecular Dynamics Simulation of Thermal Conductivity of GaN	K9-10: Nanoscale Thermal Transport Modeling And Machine Learning Ii	Wednesday, July 17
Pahinkar	Darshan	141870	Fabricating Porous Adsorbent Layers Using Stereolithography	K15-03: Laser And Optical Manufacturing	Tuesday, July 16
Palko	James W.	142411	Developing a Novel Two Phase Pore Network Algorithm for High Heat Flux Electronics Cooling Applications	Student Poster Competition	Monday, July 15
Pan	Heng	131330	Transport Phenomena in High-Speed Laser Sintering of Metal Nanoparticles	K15-02: Transport Phenomena In Manufacturing	Tuesday, July 16
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Park	Hoyeon	130709	Radiative Thermal Control in High Temperature Conditions With Hollow Microsphere-Based Optical Coatings	K12-01: Aerospace Heat Transfer I	Monday, July 15
Park	Hyunggon	130673	Investigating the Effect of Extreme Thermal Field on the Microstructure of Additive Manufactured Materials	K15-01: Additive Manufacturing And Heat Transfer	Monday, July 15
Park	Jooho	131528	Investigation of Mass Transport-Dominated Regime During Water Splitting Process	K13-04: Liquid-To-Vapor Phase-Change At Enhanced Surfaces	Wednesday, July 17
Parker	Walter	142125	Air Gap Diffusion Distillation as a Thermal Brine Concentrator	K6-07: Heat Transfer In Energy System - Components Ii	Wednesday, July 17
Patankar	Suhas	138037	The Cooling Challenge in Data Centers	S01: Symposium In Memory Of Professor Richard J. Goldstein I	Monday, July 15
Pei	Yu	130791	Low-Dimensional Heat Conduction in Surface Phonon Polariton Waveguide	K9-04: Thermal Transport In Nanomaterials Across Interfaces I	Tuesday, July 16
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Perez-Raya	Isaac	131450	Creating Fluid Flow Through Bubble Squeezing in Tapered Microgap	K8-05: Fundamentals Of Boiling/ Condensation Including Micro/ Nanoscale Effects I	Wednesday, July 17
Phillips	Agboola	132212	Water Depth and Surface Area Extension Correlation Effect on Single Basin Solar Still	K8-05: Fundamentals Of Boiling/ Condensation Including Micro/ Nanoscale Effects I	Wednesday, July 17
Pirnstill	Logan	131314	Inferring Flow Boiling Interfacial Shear Stress Using Physics Informed Neural Networks From Control Volume Models	K8-01: Fundamentals Of Machine Learning In Heat Transfer	Monday, July 15
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Qin	Zihao	138699	Electrically Gated Molecular Thermal Switch	K9-03: Tunable Thermal Transport	Monday, July 15
Raghu	Sowmya	131529	Centrifugal Compressor Design Optimization for S R-30 Small Scale Gas Turbine Engine Using Numerical Simulations and Machine Learning Approach	K14-01: Gas Turbine Heat Transfer	Wednesday, July 17
Ravichandran	Mahadevan	125633	Design and Validation Strategy for an X-Ray Target Subject to Ultra-High Heat Flux Loading	K20-02: Inverse Problems In Heat Transfer	Monday, July 15
Raza	Saqlain	138074	Molecular Dynamics Simulation of Water Evaporation From PVA Hydrogel	K9-11: Evaporative Cooling For Microsystems	Wednesday, July 17
Rivera Gonzalez	Orlando	138620	Wettability Assessment on Ultra-White Radiative Cooling Paints	K8-06: Fundamentals Of Boiling/ Condensation Including Micro/ Nanoscale Effects Ii	Wednesday, July 17
Rodriguez	Alejandro	137915	Achieving Lower Lattice Thermal Conductivity by Coherence Contribution	K9-08: Thermal Transport In Nanomaterials Across Interfaces Iv	Wednesday, July 17
Roodbari	Mahdi	138670	Subcooled Pool Boiling on Hierarchical Micro- and Nanostructure-Modified Copper Surfaces in HFE-7100 Dielectric Liquid	K13-01: Flow Boiling In Mini/Microchannels	Monday, July 15
Roy	Souvik	138496	Enhancing Steam Accumulator Performance With Packed-Bed Latent Heat Storage	K6-09: Heat Transfer In Energy Systems - Waste Heat Ii	Wednesday, July 17
Ruan	Xiulin	129810	Ultrawhite Paints for Sub-Ambient Radiative Cooling: Materials, Physics, and Climate Crisis Mitigation	K8-P1: Panel On Fundamentals Of Heat Transfer For Climate And Sustainable Energy	Monday, July 15

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Sas Brunser	Sebastian	138058	Topology Optimization of 3D-Printed Hierarchically Ordered Porous Structures to Maximize Solar Fuel Yield	S04: Symposium In Memory Of Professor Richard J. Goldstein IV	Tuesday, July 16
Sathyamurthy	Ravishankar	122480	Experimental Analysis of Solar Still Equipped With Porous Rubber Mat as Energy Storage Material	K6-03: Heat Transfer In Energy Systems - Energy Storage I	Tuesday, July 16
Seo	Jin Hyeuk	138548	Simultaneous Measurement Between Pressure and Visualization of Geyser Boiling in Two-Phase Closed Thermosyphon	K10-03: Multi-Scale Multi-Phase Heat Transfer Equipment II	Wednesday, July 17
Seo	Joohyun	142354	A Comprehensive Thermal Analysis of Dendrite Structure in Nitrate-Based Molten Salt Eutectic Nanofluids: An Integrated Microscale and Mesoscale Thermal Transport Study	K9-07: Thermal Transport In Nanomaterials Across Interfaces III	Wednesday, July 17
Sezmen	Ramazan Aykut	131081	Development of the Temperature Profile Optimization Method for Thermal Conditioning of Large Bodies	K20-02: Inverse Problems In Heat Transfer	Monday, July 15
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Shaeri	Mohammad Reza	121704	3D Printed Capillary-Driven Cold Plate for Hybrid Two-Phase Cooling System	K16-01: Heat Transfer In Electronic Equipment I	Tuesday, July 16
Shah	Harsh	132213	Investigating the Role of Surface Structures on Flow Boiling Instabilities	K13-01: Flow Boiling In Mini/Microchannels	Monday, July 15
Shahid	Muhammad Ihsan	121332	Heat Transfer Rate Analysis of Hydrogen-Enriched Internal Combustion Engine Under Different Load Conditions	K6-01: Heat Transfer In Energy Systems - Alternative Power Generation I	Monday, July 15

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Sherif	S.A.	131437	Flow Boiling Heat Transfer Characteristics of R32 Outside Three-Dimensional Enhanced Tubes	K13-04: Liquid-To-Vapor Phase-Change At Enhanced Surfaces	Wednesday, July 17
Sherif	S.A.	131475	Impact of Clean Energy on the Carbon Emission Structure of the Power Grid in China	K18/K19-01: Extreme Condition And Environmental Heat And Mass Transfer	Monday, July 15
Silva	Anisa	131037	Exploration of the Effects of Nanoscale Surface Morphology Variations on Onset of Bubble Nucleation in Water Droplets Impinging and Boiling on Nanostructured Surfaces	K8-05: Fundamentals Of Boiling/ Condensation Including Micro/ Nanoscale Effects I	Wednesday, July 17
Simons	Anthony	131320	Optimisation of Energy Usage in Some Senior High Schools in Tarkwa and Its Environs	K6-02: Heat Transfer In Energy Systems - Alternative Power Generation Ii	Monday, July 15
Singh	Ramneek	132161	Numerical Analysis of Vapor Bubble Formation in Sodium Chloride Solution During Pool Boiling	K13-02: Evaporation And Pool Boiling From Enhanced Surfaces	Tuesday, July 16
Singh	Shrutika	138458	Prediction of Transient Heat Pipe Dryout and Rewetting in Response to Pulse Loads Beyond the Capillary Limit	K16-03: Heat Transfer In Electronic Equipment Iii	Wednesday, July 17
Singla	Rohit Kumar	139018	Unveiling the Impact of Soot Particles on Glacier Melting: A Radiative Heat Transfer Perspective—Insights From a Comprehensive Mathematical Model	K18/K19-01: Extreme Condition And Environmental Heat And Mass Transfer	Monday, July 15
Smrity	Araf Mim Ahmed	137557	Enhancing Pulsating Heat Pipe Efficiency With Metallic and Metallic Oxide Nanoparticles Based Hybrid Nanofluids: A Comparative Study	Student Poster Competition	Monday, July 15
Smrity	Araf Mim Ahmed	130958	A Reproducible Molecular Dynamics Approach to Investigate the Thermal Conductivity of Al2O3 Mono Nanofluid	K20-05: Applications Of Computational Heat Transfer Iii	Tuesday, July 16
Sobhansarbandi	Sarvenaz	142466	Performance Enhancement of GaN Power Amplifier Through Integration of an Ultra-Compact Thermal Management System Integrated With Micro-Fins: A CFD Modeling and Experimental Study	K16-03: Heat Transfer In Electronic Equipment Iii	Wednesday, July 17

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Song	Youngsup	142381	Scaling for Critical Heat Flux During Pool Boiling of Micropillared and Sandblasted Surfaces	K13-02: Evaporation And Pool Boiling From Enhanced Surfaces	Tuesday, July 16
Spitzenberger	Jeremy	131925	Exergy Analysis on an Innovative Vapor-Compression Ejector Heat Pump Water Heater	K6-09: Heat Transfer In Energy Systems - Waste Heat Ii	Wednesday, July 17
Stallbaumer-Cyr	Emily	138008	Freezing Front Propagation Mechanism in Heat Pipe Geometries	K8-07: Fundamentals Of Boiling/ Condensation Including Micro/ Nanoscale Effects Iii	Wednesday, July 17
Subhi	Hamed	121822	Thermal Production Coolers Optimization for Higher Utilization and Lower GHG Emissions	K18/K19-01: Extreme Condition And Environmental Heat And Mass Transfer	Monday, July 15
Sun	Jia	130576	Advancements in Ni-P Plating Surfaces for Mitigating Crystallization Fouling in Microchannel Heat Exchangers	K10-02: Multi-Scale Multi-Phase Heat Transfer Equipment I	Wednesday, July 17
Sun	Ying	138275	Detecting Regime Transitions and Transport Mechanisms in Flow Condensation via Acoustic Signatures	K13-03: Enhanced Condensation Heat Transfer	Tuesday, July 16
Sun	Ying	142390	Recent Advances in Machine Learning for Two-Phase Flows and Heat Transfer	K8-P2: Panel On Fundamentals Of Machine Learning For Heat Transfer	Tuesday, July 16
Sunden	Bengt	123041	Thermomechanical Characteristics of X-Core Thermal Protection Structures With Various Shapes and Arrangements of Lightening Holes	K12-02: Aerospace Heat Transfer Ii	Monday, July 15
Sunden	Bengt	123888	A Parametrical Study on Thermal Performance of a Spray Liquid Cooled Chip	K10-02: Multi-Scale Multi-Phase Heat Transfer Equipment I	Wednesday, July 17
Taghavi	Hooman	131517	Optimization of Thermal Management in Power Electronics by the Design of Split Channel Cooling Systems Through Numerical Simulations	K16-02: Heat Transfer In Electronic Equipment Ii	Wednesday, July 17
Tahan	Meryem	131296	Numerical Estimation of Heat Transfer Parameters: A Study on Inverse Methods in Combustion Chambers	K20-02: Inverse Problems In Heat Transfer	Monday, July 15
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Tang	Shuxia	130166	Advancement in Lithium-Ion Battery Pack Thermal Modeling Based on Electrochemical Principles	K6-03: Heat Transfer In Energy Systems - Energy Storage I	Tuesday, July 16
Taylor	Calla	139875	Fluid Motion of Liquid Cooled Heat Sinks	Student Poster Competition	Monday, July 15
Tchouteng Njike	Ursan	131218	A Convolution Neural Network Design for Combined Image and Sensor Data Analysis to Determine Droplet Vaporization Regime and Heat Transfer Performance	K8-01: Fundamentals Of Machine Learning In Heat Transfer	Monday, July 15
Thompson	Dakotah	124325	Thermoreflectance-Based Thermometry of Silicon Thin Films With Resonantly Enhanced Temperature Sensitivity	K9-02: Nanothermal Metrology	Monday, July 15
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Tillma	Samuel	137288	Numerical Comparison of Heat Rejection Techniques for Electric Vehicle Battery Thermal Management Systems	K6-04: Heat Transfer In Energy Systems - Energy Storate Ii	Tuesday, July 16
Trinh	Ngoc Van	122433	Gas Species Separation of the Vortex Tube With Six Nozzle-Driven Vortex	K6-06: Heat Transfer In Energy System - Components I	Wednesday, July 17
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Vahab	Mehdi	138677	Modular and Interactive Ways to Teach Thermodynamics and Heat Transfer	K20-04: Applications In Computational Heat Transfer Ii	Tuesday, July 16
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Warsinger	David	148984	Designs and Materials for Improving Heat and Mass Transfer in Thermal Desalination	K10-02: Multi-Scale Multi-Phase Heat Transfer Equipment I	Wednesday, July 17
Weber	Anika	137429	Understanding Flow Inhomogeneity in Packed Beds for Solar Thermochemical Fuel Production	K10-02: Multi-Scale Multi-Phase Heat Transfer Equipment I	Wednesday, July 17
Wehmeyer	Geoff	138028	Thermal Regulator Using Passive All-Magnetic Actuation	K9-03: Tunable Thermal Transport	Monday, July 15
Weibel	Justin A.	133311	The Mechanism for Boiling Crisis Using Through-Substrate Visual and Infrared Measurements	K8-07: Fundamentals Of Boiling/ Condensation Including Micro/ Nanoscale Effects Iii	Wednesday, July 17
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Xu	Jiajun	138734	Design and Testing of 3D Printed Wick Structures Using Lattice Patterns for Heat Transfer Devices	K12-02: Aerospace Heat Transfer Ii	Monday, July 15
Xu	Zhihao	137523	Quantum Annealing Facilitated Lattice Optimization for High Entropy Alloys	K9-09: Nanoscale Thermal Transport Modeling And Machine Learning I	Wednesday, July 17
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Yang	Jae Sung	137159	A Numerical Optimization of Na-NiCl2 Battery Module Thermal Management for Energy Storage System With Multi-Step Approach	Student Poster Competition	Monday, July 15
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Xiaojia Wang, *University of Minnesota Twin Cities*

K-6: HEAT TRANSFER IN ENERGY SYSTEMS

Leitao Chen, *Embry–Riddle Aeronautical University*

K-7: THERMOPHYSICAL PROPERTIES

Troy Munro, *Brigham Young University*
Xinwei Wang, *Iowa State University*

K-8: THEORY AND FUNDAMENTAL RESEARCH

Xiulin Ruan, Purdue University
Vaibhav Bahadur, *University of Texas at Austin*

K-9: NANOSCALE THERMAL TRANSPORT

Tengfei Luo, *University of Notre Dames*
Geoff Wehmeyer, *Rice University*

K-10: HEAT TRANSFER EQUIPMENT

Arun Muley, *Boeing Company*

K-11: FIRE AND COMBUSTION

Tariq Shamim, *Northern Illinois University*

K-12: AEROSPACE HEAT TRANSFER

Ryoichi Amano, *University of Wisconsin–Milwaukee*
Ashwani Gupta, *University of Maryland*

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Chanwoo Park, *University of Missouri*
Dion Antao, *Texas A&M University*

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Atul Kohli, *Pratt & Whitney*
Eric Ruggerio, *General Electric*

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Heng Pan, *Texas A&M University*

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Amanie Abdelmessih, *California Baptist University*
Tiwei Wei, *Purdue University*
Chirag Kharangate, *Case Western Reserve University*

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Sihong Wang, *The City University of New York*

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Qiang Liao, *Institute of Engineering Thermophysics, Chongqing University*

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S.A. Sherif, *University of Florida*
Kashif Nawaz, *Oak Ridge National Laboratory*

K-20: COMPUTATIONAL HEAT TRANSFER

Hamidreza Najafi, *Florida Institute of Technology*
John Tencer, *Sandia National Laboratories*

SESSION	SESSION CHAIR/ CO-CHAIR NAME	AFFILIATION
K6-01: Heat Transfer In Energy Systems - Alternative Power Generation I	Chen Leitao Lee Hohyun Mwesigye Aggrey	Embry-Riddle Aeronautical University Santa Clara University University of Calgary
K6-02: Heat Transfer In Energy Systems - Alternative Power Generation II	Lee Hohyun Chen Leitao Mwesigye Aggrey	Santa Clara University Embry-Riddle Aeronautical University University of Calgary
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K6-04: Heat Transfer In Energy Systems - Energy Storate II	Iverson Brian Chen Leitao	Brigham Young University Embry-Riddle Aeronautical University
K6-05: Heat Transfer In Energy Systems - Energy Storate III	Iverson Brian Lee Hohyun	Brigham Young University Santa Clara University
K6-06: Heat Transfer In Energy System - Components I	Mulford Rydge Lee Hohyun	University of Dayton Santa Clara University
K6-07: Heat Transfer In Energy System - Components II	Lee Hohyun Mulford Rydge	Santa Clara University University of Dayton
K6-08: Heat Transfer In Energy Systems - Waste Heat I	Diaz Gerardo Lee Hohyun	Univ Of California Merced Santa Clara University
K6-09: Heat Transfer In Energy Systems - Waste Heat II	Diaz Gerardo Lee Hohyun	Univ Of California Merced Santa Clara University
K7-01: Thermophysical Properties I	Munro Troy Wang Xinwei	BYU Iowa State University
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K8-01: Fundamentals Of Machine Learning In Heat Transfer	Carey Van Ruan Xiulin	Berkeley University Purdue
K8-02: Fundamentals Of Phonons, Electrons, And Transport Properties	Feser Joseph Ruan Xiulin	University of Delaware Purdue
K8-03: Fundaments Of Multi-Physics Transport And Machine Learning	Pahinkar Darshan Oiveto Vincent	Florida Tech N/A
K8-04: Fundamentals Of Thermal Transport In Porous Media And Single-Phase Convection	Manca Oronzio Xu Yuhao Kuznetsov Andrey	Università degli Studi della Campania PVAMU NCSU
K8-05: Fundamentals Of Boiling/Condensation Including Micro/Nanoscale Effects I	Narain Amitabh Lu Ming-Chang	Michigan Technological University National Taiwan University
K8-06: Fundamentals Of Boiling/Condensation Including Micro/Nanoscale Effects II	Dhillon Navdeep Singh Bellur Kishan	California State University, Long Beach N/A
K8-07: Fundamentals Of Boiling/Condensation Including Micro/Nanoscale Effects III	Zou An Liu Dong	Advanced Cooling Technologies University of Houston
K8-P1: Panel On Fundamentals Of Heat Transfer For Climate And Sustainable Energy	Zhang Richard	zihao.zhang@unt.edu

Session Organizers

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K8-P3: Panel On Fundamentals Of Semiconductor Thermal Management	Bahadur Vaibhav	University of Texas Austin
K9-01: Radiative Thermal Energy Conversion With Nanostructures	Zhu Linxiao Zheng Yi Fan Jiadi	Penn State University Northeastern University 3M
K9-02: Nanothermal Metrology	Hodges Wyatt Beechem Thomas	Sandia National Laboratory Sandia Naitonal Laboratories
K9-03: Tunable Thermal Transport	Hu Yongjie Edalatpour Sheila	University of California, Los Angeles University of Maine
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K9-05: Radiative Cooling And Radiative Properties Of Nanomaterials	Zheng Yi Zhang Richard Seo Joohyun	Northeastern University zihao.zhang@unt.edu University of North Texas
K9-06: Thermal Transport In Nanomaterials Across Interfaces II	Wehmeyer Geoff Lu Ming-Chang	Rice University National Taiwan University
K9-07: Thermal Transport In Nanomaterials Across Interfaces III	Lee Ming-Tsang Wehmeyer Geoff Xiong Guoping	National Tsing Hua University Rice University Mechanical Engineering, the University of Texas at Dallas
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K10-03: Multi-Scale Multi-Phase Heat Transfer Equipment Ii	Singh Prashant Nawaz Kashif	Oak Ridge National Laboratory
K11-01: Fire And Combustion I	Shamim Tariq Ghamari Mohsen Farouk Bakhtier	Northern Illinois University Wilkes University Drexel University, MEM Dept

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K11-02: Fire And Combustion II	Farouk Bakhtier Shamim Tariq Ghamari Mohsen	Drexel University, MEM Dept Northern Illinois University Wilkes University
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K12-02: Aerospace Heat Transfer II	Gupta Ashwani Amano Ryoichi	University of Maryland
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K15-01: Additive Manufacturing And Heat Transfer	Kinzel Edward Pan Heng	 Texas A&M University
K15-02: Transport Phenomena In Manufacturing	Wen Sy-Bor Kinzel Edward	Texas A&M University
K15-03: Laser And Optical Manufacturing	Pan Heng Wen Sy-Bor	Texas A&M University Texas A&M University
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K16-02: Heat Transfer In Electronic Equipment II	Wei Tiwei Kharangate Chirag	Purdue University Case Western Reserve Univerisity
K16-03: Heat Transfer In Electronic Equipment III	Wei Tiwei Marconnet Amy	Purdue University Purdue University
K17-01: Heat And Mass Transfer In Biotechnology	Wang Sihong Rylander Christopher	N/A N/A
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K20-01: Applications Of Machine Learning/Ai For Heat Transfer	Samadi Forooza Najafi Hamidreza	The University of Alabama Florida Tech
K20-02: Inverse Problems In Heat Transfer	Najafi Hamidreza Samadi Forooza	Florida Tech The University of Alabama

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K20-03: Applications Of Computational Heat Transfer I	Dr. MD Didarul Islam Tencer John	Villanova University Sandia National Lab
K20-04: Applications In Computational Heat Transfer II	Dr. Aaron Wemhoff Tencer John	Villanova Sandia National Lab
K20-05: Applications Of Computational Heat Transfer III	Tencer John Najafi Hamidreza	Sandia National Lab Florida Tech
K20-06: Methods In Computational Heat Transfer	Mazumder Sandip Chen Leitao	Ohio State University Embry-Riddle Aeronautical University
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K20-W2: Workshop On Inverse Problems And Parameter Estimation In Heat Transfer Ii	Dowding Kevin Najafi Hamidreza	Sandia Florida Tech
S01: Symposium In Memory Of Professor Richard J. Goldstein I	Simon Terrence Han Sangjo	University of Minnesota Seoul National University of Science and Technology
S02: Symposium In Memory Of Professor Richard J. Goldstein II	Han Sangjo Simon Terrence	Seoul National University of Science and Technology University of Minnesota
S03: Symposium In Memory Of Professor Richard J. Goldstein III	Simon Terrence Han Sangjo	University of Minnesota Seoul National University of Science and Technology
S04: Symposium In Memory Of Professor Richard J. Goldstein IV	Srinivasan Vinod Wang Xiaojia	University of Minnesota University of Minnesota
S05: Symposium In Memory Of Professor Richard J. Goldstein V	Wang Xiaojia Srinivasan Vinod	University of Minnesota University of Minnesota
S06: Symposium In Memory Of Professor Richard J. Goldstein VI	Srinivasan Vinod Wang Xiaojia	University of Minnesota University of Minnesota
Student Poster Competition	Najafi Hamidreza Mulford Rydge	Florida Tech University of Dayton

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Brigham Young University

Dr. Brent Webb is Karl G. Maeser Distinguished University Professor at Brigham Young University. His current research focuses on radiation heat transfer in high temperature gases. He is Past Chair of the Heat Transfer Division Executive Committee.

Conference Co–chair
Dr. Zhuomin Zhang
Georgia Institute of Technology

Dr. Zhuomin Zhang holds a J. Erskine Love, Jr., Professorship in Mechanical Engineering at the Georgia Institute of Technology. Professor Zhang's research expertise is in micro/nanoscale thermal radiation and thermophysical properties of micro/nanostructured materials, with applications to semiconductor manufacturing and energy harvesting. He is an ASME Fellow, a recipient of the 2021 ASME Yeram S. Touloukian Award, and currently Treasurer of the Heat Transfer Division Executive Committee.

Student Activities Chair
Dr. Rydge Mulford
University of Dayton

Dr. Rydge Mulford is an assistant professor of Mechanical and Aerospace Engineering at the University of Dayton. As Director of the Dayton Thermal Applications Laboratory, his research focuses on thermal system design of energy systems, ranging from solar panels to hypersonic vehicles. He is the secretary of the K6 committee in the ASME Heat Transfer Division.

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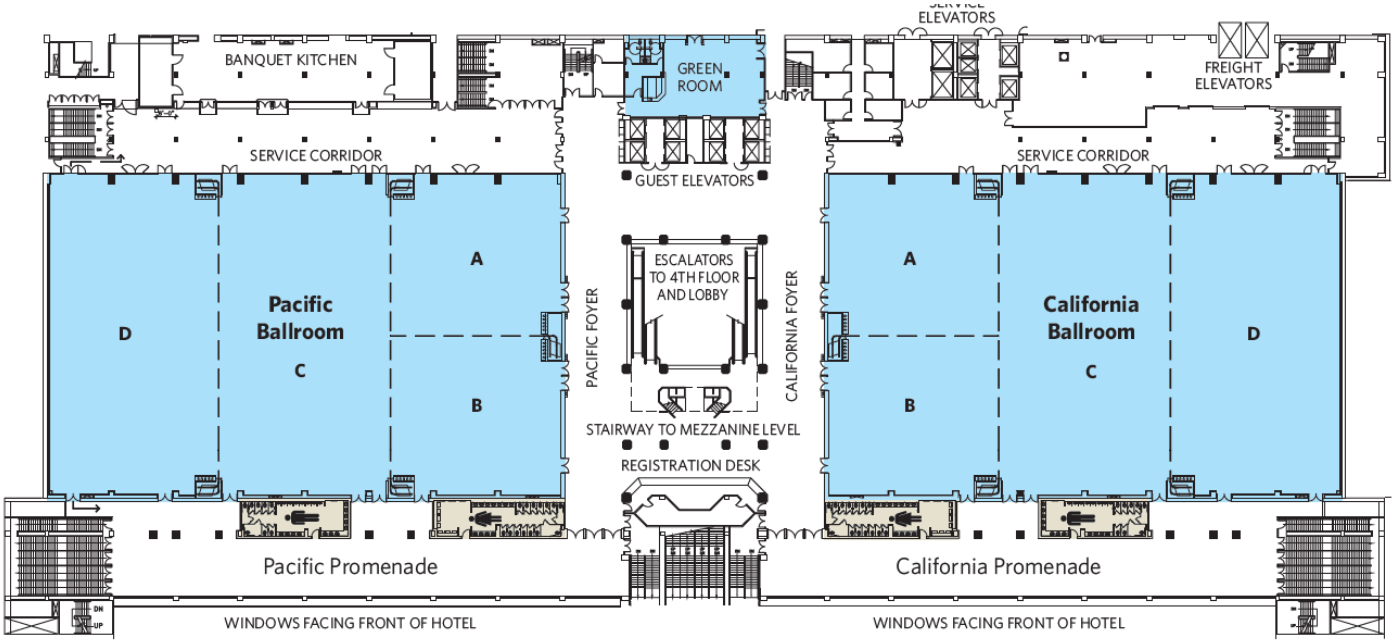

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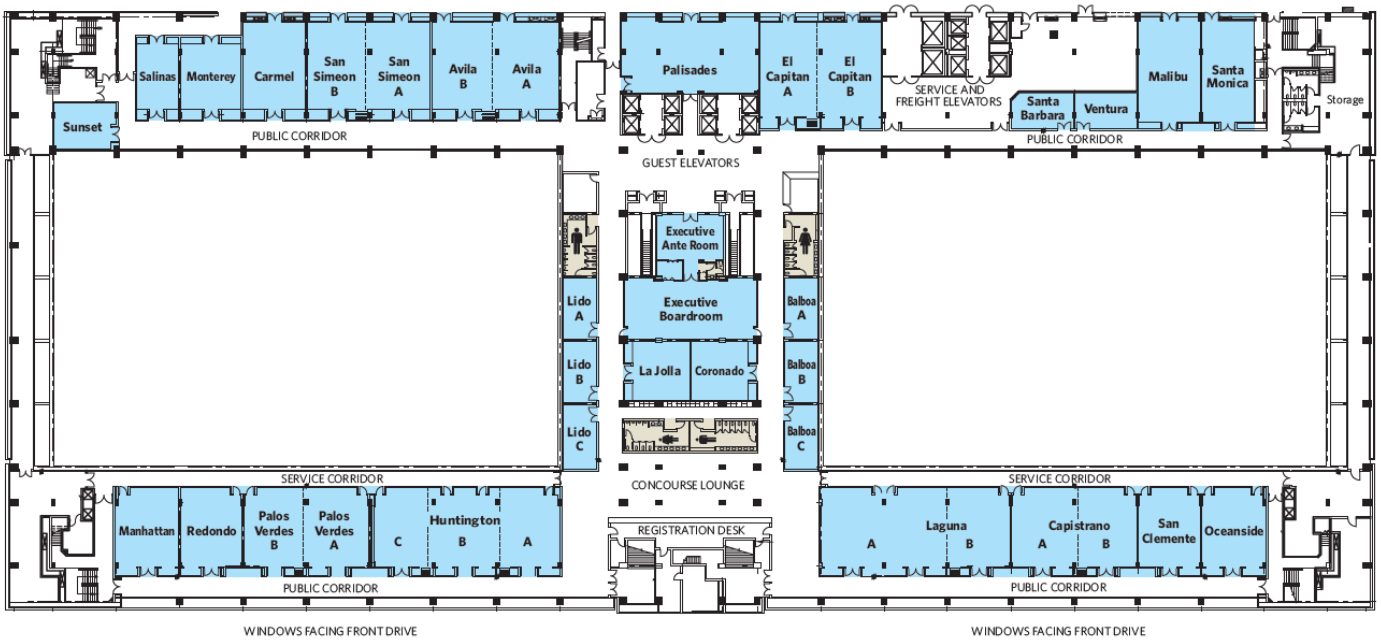

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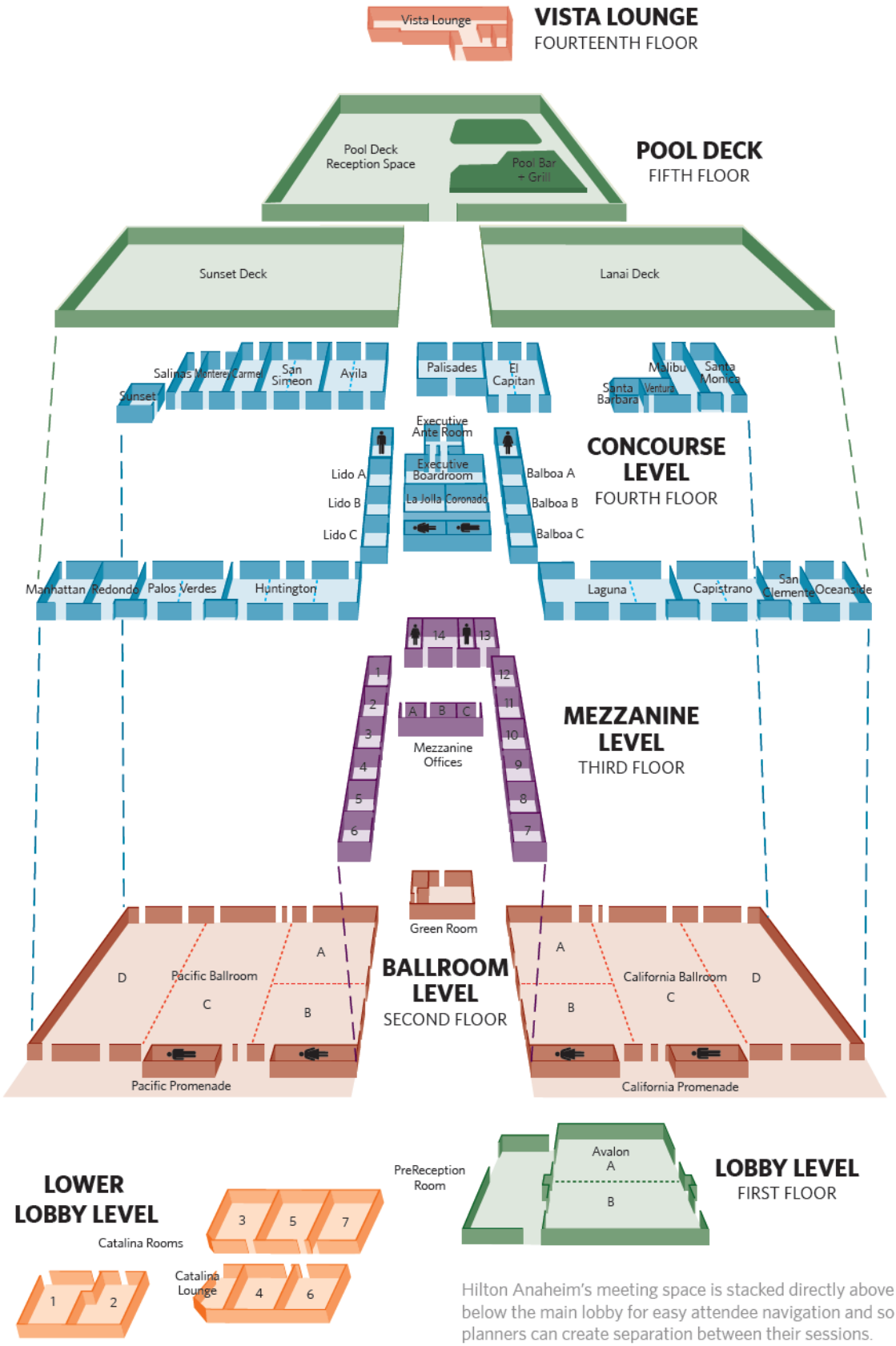

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