ASME 2025 SHTC

Summer Heat Transfer Conference

CONFERENCE
July 8–10, 2025

The Westin Westminster
Westminster, CO

Program

event.asme.org/SHTC

The American Society of Mechanical Engineers®
ASME®

ASME
SETTING THE STANDARD

Welcome

FROM THE CONFERENCE ORGANIZERS

Welcome to the 2025 Summer Heat Transfer Conference!

We are pleased to welcome you to the 2025 Summer Heat Transfer Conference (SHTC), taking place July 8 to 10 in Westminster, Colorado. This year's conference is co-located with the Energy Sustainability and Fluids Engineering Division meetings and brings together engineers, researchers, and practitioners from across the thermal sciences.

SHTC 2025 features over 300 technical presentations, including keynote lectures, invited talks, symposia, panel discussions, and workshops. We are especially honored to host two special symposia celebrating the careers of Professors Vijay K. Dhir and Arthur E. Bergles.

Two panel discussions are planned as part of the program. The first, organized by the Computational Heat Transfer (K20) Technical Committee, focuses on inverse problems in heat transfer. Panelists will share insights from the 2024 International Conference on Inverse Problems in Engineering and highlight recent developments in AI, physics-informed neural networks, and practical applications across aerospace, energy, and electronics cooling. The second panel, organized by the ASME Journal of Engineering for Sustainable Buildings and Cities, will explore how AI and machine learning are shaping high performance and resilient buildings and urban infrastructure. Topics will include smart HVAC systems, energy modeling, grid integration, and the role of digital twins.

A special panel and networking event will also be held on July 8 to welcome newcomers. This session is intended for first-time attendees, early-career professionals, and students, and will include practical guidance on navigating the conference, getting involved in technical committees, and building professional networks within ASME.

In addition, a career panel is planned that will feature professionals from academia, industry, and national laboratories. This session will provide valuable insight for students and early-career engineers exploring career pathways in the thermal sciences.

The conference will also feature a hands-on workshop on Simscape Fluids modeling and simulation, hosted by the K20 committee on July 7. Attendees are also invited to participate in a technical tour of the National Renewable Energy Laboratory, also scheduled for July 7.

We are grateful to the many individuals who made this conference possible, including the track and session chairs, reviewers, symposium and panel organizers, and ASME staff. In particular, we thank Mary Jakubowski, Mark Avila, and April Tone for their continued support and coordination.

Thank you for being part of the SHTC community. Whether this is your first time attending or you are a long-time participant, we hope you find the sessions engaging, the discussions productive, and the overall experience worthwhile.

We look forward to seeing you in Westminster.

Dr. Sandra Boetcher, Conference Chair, *Embry-Riddle Aeronautical University*

Dr. Rydge Mulford, Technical Program Chair, *University of Dayton*

Contents

Conference Information

REGISTRATION INFORMATION

Westminster Foyer, First Floor

Registration Hours:

Monday, July 7, 10:00AM–6:00PM

Tuesday, July 8, 7:00AM–5:00PM

Wednesday, July 9, 7:00AM–5:00PM

Thursday, July 10, 7:00AM–3:00PM

EXHIBIT INFORMATION

Westminster Ballroom Foyer, First Floor

Hours

Tuesday–Thursday, July 8–10,
10:00AM–4:00PM

Don't forget to stop by and visit our Exhibitors. 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 Thursday from 8:00AM-5:00PM in the Westminster Office II, First Floor.

SPEAKER READY ROOM

The Speaker Ready Room is located in Westminster Office II, First Floor and will be available per the schedule below to review and/or practice your presentation. A screen and LCD Projector will be provided.

Tuesday, July 8, 8:00AM–5:00PM

Wednesday, July 9, 8:00AM–5:00PM Thursday, July 10, 8:00AM–5:00PM

BADGE REQUIRED FOR ADMISSION

All conference attendees must always wear the official ASME 2025 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 Wednesday, July 9, 12:00PM–1:30PM in Legacy Ballroom on the First Floor.

Please attend the luncheon for the conference you signed up for. We will be checking badges at the door.

CONFERENCE LUNCHES/POSTER PRESENTATIONS

On Tuesday and Thursday, Conference lunches for both conferences will be held from 12:00PM to 1:30PM in the Legacy Ballroom located on the First Floor. Please join your fellow attendees for a good meal and a great networking opportunity. Please note, on Tuesday, 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. On Wednesday, the SHTC Awards Luncheon will be held in the Legacy Ballroom.

CONFERENCE APP

Both 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 NETWORKING BREAKS

Morning and afternoon breaks will be provided in the Westminster Ballroom Foyer on the First Floor. Come and meet our exhibitors, Carrier Corporation and AMBA and join your fellow attendees for a few minutes of networking and discussion. The schedule is as follows:

Tuesday–Thursday, July 8–10, 10:00AM–10:20AM and 3:10PM–3:30PM

EMERGENCY INFORMATION

If an emergency occurs, immediately call 911 THEN Hotel Security

Notifying Guests of Emergency Evacuations:

At the Westin Westminster, if an evacuation is needed, the Fire Department and/or Hotel Security will make an announcement over the Hotel's P.A. system. They have specific plans, depending on the situation, to inform and direct all building occupants in a calm and clear manner. If it is deemed necessary to evacuate the building, specific instructions will be given by Hotel Management.

Hotel's Pre-determined Meeting Point in Case of Fire or Hotel Emergency:

Westin Westminster: Hotel Staff/Emergency Personnel will announce location of where to evacuate based on the location of the emergency (i.e., fire, etc.).

Local/Nearby Medical Centers

US Health Broomfield Hospital, 11820 Destination Dr., Broomfield, 80021; (303) 464-4500

Advanced Urgent Care, 9960 Wadsworth Pkwy., Suite 100, Westminster, 80021; (303) 659-9700

FIRE/SMOKE

If a "clear and present danger" exists, begin evacuating those in danger, and yourself to a safer location…as you report the emergency to Hotel Security and 911. \

Always remember that your personal safety is of the utmost importance. Leave dangerous situations to the professionals!

EMERGENCY EVACUATION PROCEDURES

A building evacuation is necessary whenever a fire alarm sounds and building occupants should exit immediately. After a building has been evacuated, occupants must wait for Police and Security or safety personnel to evaluate the situation prior to reentry.

Once outside the building, DO NOT RE-ENTER under any circumstances until you are told it is safe to do so. If you believe someone is still in the building, immediately notify the Fire Department or Hotel Staff.

MEETING ROOM EMERGENCY PLAN

If you are in a meeting room or in the foyer and hear a fire alarm, a public address announcement, or a public safety official (i.e., security, fire, or police) calling for an evacuation, hotel staff will assist attendees in leaving the meeting room in a calm and orderly manner via the closest available exit.

The Hotel recommends that attendees continue walking in the direction of the exit signage until they find themselves in a safe area outside the building, such as the parking lots.

Emergency exit signage is continuous throughout the facility to the open areas outside. By simply following these signs, attendees should be taking the shortest route to a safe area.

All emergency exit signs and overhead emergency lights will remain illuminated, even in the event of a power failure.

In any situation requiring evacuation, emergency exits and egress corridors are essential for those exiting the building and for emergency personnel entering the building. It is imperative that they remain unobstructed at all times.

Conference Information

INTERNET ACCESS

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

Network: MarriottBonvoy_Conference
Password: 24westin24

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/memberships 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

Westminster Office I, First Floor
Tuesday–Thursday, 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.

WESTIN WESTMINSTER PARKING

Current Parking Charges:

Self-Parking (with in & out privileges)

$10.00 per day per car

NREL TECHNICAL TOUR – SOLD OUT

National Renewable Energy Laboratory's (NREL's) Golden Laboratories

Date: Monday, July 7, 2025
Time: 10:30am–3:30pm
Price: $40

Join us for a half-day tour of the National Renewable Energy Laboratory (NREL) during the ASME Energy Sustainability (ES 2025) and Summer Heat Transfer (SHTC 2025) Conference.

This exclusive visit, designed specifically for ES/SHTC Conference attendees, will feature a specialized tour showcasing cutting-edge research in sustainable energy. Gain firsthand insight into NREL's state-of-the-art innovations and explore groundbreaking advancements shaping the future of energy sustainability.

Facilities may include*:

- Energy Systems Integration Facility
- High-Flux Solar Furnace

*Exact labs subject to change

Please be aware that any non-us citizens wanting to attend the tour will need to have additional paperwork completed 45 days i

- ASME will share all tour registrants' names and contact information with the facility for security clearance.
- A government-issued photo identification (for example driver's license, passport, or military ID) will be required for all attendees before entering the site.
- The tour is limited to 30 people. First-come, first-served.
- NREL Tour signup deadline is May 23, 2025.

High Altitude Tips
NREL is located at a high altitude with varying weather conditions. Before traveling to the Campus, please plan accordingly. See high altitude tips on VISIT Denver, the travel and visitor website.

Schedule at a Glance

MOUNTAIN TIME	MONDAY, JULY 7TH	LOCATION
10:00AM--06:00PM	Registration	Westminster Foyer
10:30AM--03:00PM	NREL Tour	Meet in Lobby
12:00PM--03:00PM	HTD EC Closed Meeting	Westin Boardroom
02:00PM--05:00PM	Workshop: Modeling and Simulation of Heat Transfer and Thermofluidic Systems with Simscape Fluids (Separate Registration Fee Required)	Standley Ballroom II
03:00PM--06:00PM	HTD EC Open Meeting	Westin Boardroom
06:00PM--07:00PM	Opening Reception	South Courtyard
MOUNTAIN TIME	**TUESDAY, JULY 8TH**	**LOCATION**
07:00AM--05:00PM	Registration	Westminster Foyer
07:00AM--05:00PM	Mother's Room	Westminster Office I
08:00AM--05:00PM	Speaker Ready Room	Westminster Office II
08:00AM--09:00AM	SHTC Panel: Inverse Problems in Heat Transfer: Insights from ICIPE 2024 - Advances in Methodology & Applications (Date/Time TBD)	Westminster Ballroom III
09:00AM--10:00AM	SHTC Plenary: Dr. Rama Venkatasubramanian	Westminster Ballroom III
10:00AM - 04:00PM	Exhibits	Westminster Foyer
10:00AM--10:20AM	Networking Break	Westminster Foyer
10:00AM--10:20AM	Joint ES/SHTC Newcomer Panel	Westminster Ballroom III
10:20AM--12:00PM	K8 - 01 - Fundamentals of Machine Learning for Heat Transfer	Standley Ballroom II
10:20AM--12:00PM	K10 - 01 - Heat Transfer Equipment	Cotton Creek I
10:20AM--12:00PM	K6 - 01 - Heat Transfer In Energy System - Waste Heat I	Cotton Creek II
10:20AM--12:00PM	K12-01 - Aerospace Heat Transfer I	Gray's Peak
10:20AM--12:00PM	K16 - 01 - Heat Transfer in Electronic Equipment I	Long's Peak
10:20AM--12:00PM	K20 - 01 - Novel Numerical Methods for Heat Transfer Applications	Waverly
10:20AM--12:00PM	ASME Symposium Celebrating Professor Vijay K. Dhir - Session 1	Westminster Ballroom I
12:00PM--01:30PM	Lunch and Poster Session	Legacy Ballroom & Foyer
01:30PM--03:10PM	K9-01 - Nanothermal Metrology	Standley Ballroom II
01:30PM--03:10PM	K6 - 02 - Heat Transfer In Energy System - Waste Heat II	Cotton Creek I
01:30PM--03:10PM	K7 - 01 - Optical Characterization of Thermophysical Properties	Cotton Creek II
01:30PM--03:10PM	K20 - 02 - Computational Bio Heat Transfer	Waverly
01:30PM--03:10PM	K12 - 02 - Aerospace Heat Transfer II	Long's Peak
01:30PM--03:10PM	K8 - Panel 1 - Fundamentals of Machine Learning for Heat Transfer	Gray's Peak
01:30PM--03:10PM	ASME Symposium Celebrating Professor Vijay K. Dhir - Session 2	Westminster Ballroom I
03:10PM--03:30PM	Networking Break	Westminster Foyer
03:30PM--05:10PM	K9-02 - Radiative Cooling and Radiative Properties of Nanomaterials	Standley Ballroom II
03:30PM--05.10PM	K6 - 03 - Heat Transfer In Energy System - Components I	Cotton Creek I
03:30PM--05.10PM	K7 - 02 - Applications of Thermophysical Characterization	Cotton Creek II

Schedule at a Glance

03:30PM--05.10PM	K20 - 03 - Computational Heat Transfer in Fluid Applications	Waverly
03:30PM--05.10PM	K16 - 02 - Heat Transfer In Electronic Equipment II	Long's Peak
03:30PM--05.10PM	K15 - 01 - Laser, Optical and Thermal Manufacturing	Gray's Peak
03:30PM--05.10PM	ASME Symposium Celebrating Professor Vijay K. Dhir - Session 3	Westminster Ballroom I
06:20PM--08:20PM	SHTC K6 - Heat Transfer in Energy Systems Committee Meeting	Westminster Ballroom I
06:20PM--08:20PM	SHTC K8 - Theory and Fundamental Research Committee Meeting	Standley Ballroom II
06:20PM--08:20PM	SHTC K12 - Aerospace Heat Transfer Committee Meeting	Cotton Creek I
06:20PM--08:20PM	SHTC K13 - Heat Transfer in Multiphase Flow Committee Meeting	Cotton Creek II
06:20PM--08:20PM	SHTC K14 - Gas Turbine Heat Transfer Committee Meeting	Waverly
06:20PM--08:20PM	SHTC K15 - Transport Phenomena in Manufacturing and Materials Processing Committee Meeting	Long's Peak
06:20PM--08:20PM	SHTC K10 - Heat Transfer Equipment Committee Meeting	Gray's Peak
MOUNTAIN TIME	**WEDNESDAY, JULY 9TH**	**LOCATION**
07:00AM--05:00PM	Registration	Westminster Foyer
07:00AM--05:00PM	Mother's Room	Westminster Office I
08:00AM--05:00PM	Speaker Ready Room	Westminster Office II
09:00AM--10:00AM	SHTC Plenary: Dr. Joel Plawsky	Westminister Ballroomn III
10:00AM - 04:00PM	Exhibits	Westminster Foyer
10:00AM--10:20AM	Networking Break	Westminster Foyer
10:20AM--12:00PM	K8 - 02 - Fundamentals of Radiative Heat Transfer including Nanoscale Phenomena	Standley Ballroom II
10:20AM--12:00PM	K17 - 01 - Heat and Mass Transfer in Biotechnology	Cotton Creek I
10:20AM--12:00PM	K6 - 04 - Heat Transfer In Energy System - Components II	Cotton Creek II
10:20AM--12:00PM	K13 - 01 - Flow Boiling I	Waverly
10:20AM--12:00PM	K20 - 04 - Computational Heat Transfer for Energy	Long's Peak
10:20AM--12:00PM	K16 - 03 - Heat Transfer In Electronic Equipment III	Gray's Peak
10:20AM--12:00PM	ASME Symposium Celebrating Professor Vijay K. Dhir - Session 4	Westminster Ballroom I
10:20AM--12:00PM	90th Birthday Memorial Symposium: Celebrating the Legacy of Arthur E. Bergles - Session II	Lakehouse
12:00PM--01:30PM	Heat Transfer Division Awards Luncheon	Legacy Ballroom
01:30PM--03:10PM	K6 - 05 - Heat Transfer In Energy System - Thermal and Electrochemical Energy Storage I	Standley Ballroom II
01:30PM--03:10PM	K13 - 02 - Flow Boiling II	Cotton Creek I
01:30PM--03:10PM	K20 - 05 - Micro and Nanoscale Computational Heat Transfer	Cotton Creek II
01:30PM--03:10PM	K16 - 04 - Heat Transfer In Electronic Equipment IV	Waverly
01:30PM--03:10PM	K9-03 - Interfacial Thermal Transport	Long's Peak
01:30PM--03:10PM	K8 - Panel 2 - Fundamentals and Applications of Semiconductor Thermal Management	Gray's Peak

01:30PM--03:10PM	ASME Symposium Celebrating Professor Vijay K. Dhir - Session 5	Westminster Ballroom I
01:30PM--03:10PM	90th Birthday Memorial Symposium: Celebrating the Legacy of Arthur E. Bergles - Session II	Lakehouse
03:10PM--03:30PM	Networking Break	Westminster Foyer
03:30PM--05:10PM	K9-04 - Emerging Energy Carriers	Standley Ballroom II
03:30PM--05:10PM	K9-05 - Nanoscale Thermal Transport Theory	Cotton Creek I
03:30PM--05:10PM	K6 - 06 - Heat Transfer In Energy System - Thermal and Electrochemical Energy Storage II	Cotton Creek II
03:30PM--05:10PM	K13 - 03 - Flow Boiling III	Waverly
03:30PM--05:10PM	K13 - 04 - Liquid-to-Vapor Phase-Change at Enhanced Surfaces I	Long's Peak
03:30PM--05:10PM	K8 - 03 - Fundamentals of Phase Change including Micro/Nanoscale Effects I	Gray's Peak
03:30PM--05:10PM	ASME Symposium Celebrating Professor Vijay K. Dhir - Session 6	Westminster Ballroom I
05:20PM--06:20PM	SHTC/ES Career Panel	Gray's Peak
06:20PM--08:20PM	SHTC K9 - Nanoscale Thermal Transport Committee Meeting	Cotton Creek I
06:20PM--08:20PM	SHTC K20 - Computational Heat Transfer Committee Meeting	Cotton Creek II
MOUNTAIN TIME	**THURSDAY, JULY 10TH**	**LOCATION**
07:00AM--05:00PM	Registration	Westminster Foyer
07:00AM--05:00PM	Mother's Room	Westminster Office I
08:00AM--05:00PM	Speaker Ready Room	Westminster Office II
09:00AM--10:00AM	SHTC Plenary: Professor Yasuyuki Takata	Westiminster Ballroom III
10:00AM - 04:00PM	Exhibits	Westminster Foyer
10:00AM--10:20AM	Networking Break	Westminster Foyer
10:20AM--12:00PM	K9-06 - Thermal Transport in Nanomaterials 1	Standley Ballroom II
10:20AM--12:00PM	K9-07 - Near-Field Thermal Radiation	Cotton Creek I
10:20AM--12:00PM	K6 - 07 - Heat Transfer In Energy System - Alternative Power Generation I	Cotton Creek II
10:20AM--12:00PM	K13 - 05 - Liquid-to-Vapor Phase-Change at Enhanced Surfaces II	Waverly
10:20AM--12:00PM	K10 - 02 - Heat Transfer Equipment	Long's Peak
10:20AM--12:00PM	K20 - 06 - Computational Heat Transfer in Fluid Applications	Gray's Peak
10:20AM--12:00PM	K8 - 04 - Fundamentals of Phase Change including Micro/Nanoscale Effects II	Westminster Ballroom I
12:00PM--01:30PM	SHTC & ES Lunch	Legacy Ballroom
01:30PM--03:10PM	K9-08 - Thermal Transport in Nanomaterials/across Interfaces 2	Standley Ballroom II
01:30PM--03:10PM	K6 - 08 - Heat Transfer In Energy System - Alternative Power Generation II	Cotton Creek I
01:30PM--03:10PM	K13 - 06 - Pool Boiling from Enhanced Surfaces	Cotton Creek II
01:30PM--03:10PM	K10 - 03 - Heat Transfer Equipment	Waverly
01:30PM--03:10PM	K20 - 07 - Computational Heat Transfer for Energy	Long's Peak
01:30PM--03:10PM	"K6 - 09 - Thermal Energy Storage Symposium I	Gray's Peak

Schedule at a Glance

01:30PM--03:10PM	K8 - 05 - Fundamentals of Single Phase Convection or Multiphysics Transport	Westminster Ballroom I
03:10PM--03:30PM	Networking Break	Westminster Foyer
03:30PM--05:10PM	K13 - 07 - Enhanced Condensation Heat Transfer	Standley Ballroom II
03:30PM--05:10PM	K10 - 04 - Heat Transfer Equipment	Cotton Creek I
03:30PM--05:10PM	K20 - 08 - Computational Heat Transfer: Applications	Cotton Creek II
03:30PM--05:10PM	K6 - 10 - Thermal Energy Storage Symposium II	Long's Peak
03:30PM--05:10PM	K15 - 02 - Transport Phenomena in Manufacturing and Energy Manufacturing I	Gray's Peak
03:30PM--05:10PM	K9-09 - Tunable Thermal Transport	Westminster Ballroom I
03:30PM--05:10PM	K9-10 - Nanoscale Evaporation and Nano Fluids	Meadowbrook Balllroom I
03:30PM--05:10PM	K9-11 - Nanoscale Thermal Transport Modeling and Machine Learning	Waverly
05:10PM	CONFERENCE ENDS	

Committee Meetings

TIME	EVENT	ROOM
MONDAY, JULY 7		
12:00PM–3:00PM	SHTC HTD EC Meeting – Closed	Westin Boardroom
3:00PM–6:00PM	SHTC HTD EC Meeting – Open	Westin Boardroom
TUESDAY, JULY 8		
6:20PM–8:20PM	K-6 Heat Transfer in Energy Systems	Westminster Ballroom I
6:20PM–8:20PM	K-8 Theory and Fundamental Research	Standley Ballroom II
6:20PM–8:20PM	K-12 Aerospace Heat Transfer	Cotton Creek I
6:20PM–8:20PM	K-13 Heat Transfer in Multiphase Flow	Cotton Creek II
6:20PM–8:20PM	K-14 Gas Turbine Heat Transfer	Waverly
6:20PM–8:20PM	K-15 Transport Phenomena in Manufacturing and Materials Processing	Long's Peak
6:20PM–8:20PM	K-10 Heat Transfer Equipment	Gray's Peak
WEDNESDAY, JULY 9		
6:20PM–8:20PM	K9 - Nanoscale Thermal Transport	Cotton Creek I
6:20PM–8:20PM	K20 - Computational Heat Transfer	Cotton Creek II

Workshops

MONDAY, JULY 7 **2:00PM–5:00PM**
STANDLEY BALLROOM, FIRST FLOOR

Fee $35

Organized by Computational Heat Transfer (K20) Technical Committee
Modeling and Simulation of Heat Transfer and Thermofluidic Systems with Simscape Fluids

Presenters:
Andrew Greff, *Senior Application Engineer, MathWorks*
Mehdi Vahab, *Manager for Mechanical and Aerospace Engineering, MathWorks*

Join us for a hands-on session for computational modeling and simulation of heat transfer and thermofluidic systems. By the end of this workshop, you will have the working experience of creating such systems in Simscape Fluids and using them for engineering design and implementation. Attendees are encouraged to bring their laptops to the session. A workshop license for MathWorks products will be shared with attendees before the conference.

Session 1 (1.5 hours): Fundamentals & Basic Simulations
- Introduction to Simulink and Simscape Fluids
- Example I: Modeling heat transfer through solid geometries
- Example II: Thermal exchange in piping systems

Session 2 (1.5 hours): Applied Systems & Advanced Features
- Example III: Heat exchanger modeling
  - o Parametrizing a simple heat exchanger based on fluid properties and geometry
  - o Understanding initial conditions
- Example IV: EV battery cooling system design
  - o Challenges in thermal management for electric vehicles
  - o Simulation of cooling strategies to maintain optimal battery tempera ture
  - o Walkthrough EV Battery Cooling System Design demo
- Advanced Simscape Fluids features
  - o Matching heat exchangers with performance data
  - o Simulating complex geometries and varying operating conditions
  - o Importing REFPROP fluids
- Real-world applications and Q&A session

Presenter Biographies

Andrew Greff is a senior application engineer at MathWorks. He specializes in physical modeling using Simscape and focuses on thermal, fluid, and multibody systems. Before joining MathWorks, Andrew worked for GM and Stellantis developing advanced hardware and controls for engines. He obtained his PhD in mechanical engineering from the University of Alabama.

Mehdi Vahab is the Academic Manager for Mechanical and Aerospace Engineering at MathWorks. He specializes in physical and computational modeling for fluid and thermal systems. Before MathWorks, he developed numerical methods for multiphase systems and phase-change dynamics, applied to problems like heat transfer in pool boiling, hypersonic vehicle thermal management, and snow melting in open waters. At MathWorks, he assists researchers, faculty, and students by finding better solutions for their research and teaching challenges.

TUESDAY, JULY 8 **9:00AM–10:00AM**
WESTIMINSTER BALLROOM III, FIRST FLOOR

Thermal Transport in Nano-engineered Materials at Extreme Temperatures and their Relevance for Solid state cooling and Power generation

Dr. Rama Venkatasubramanian
Johns Hopkins University - Applied Physics Lab, Laurel, MD

We will discuss the use of nano-engineered thin-film materials, specifically single-period superlattices (SLs) and controlled hierarchically engineered superlattice structures (CHESS) fabricated using advanced epitaxial deposition techniques, to control the thermal transport between cryogenic temperatures (-200oC) to near room temperature (100oC). The thermal conductivities were measured using Frequency Domain Thermo Reflectance (FDTR); these properties are relevant in thermoelectric materials for use in a range of cooling applications for electronics and photonics to refrigeration, and for energy harvesting from ubiquitous low-grade heat sources. We will discuss the impact of nano-engineering for improved device performance in these domains.
Next, we will also discuss the thermal transport and other properties from room temperature to extremely high temperatures (~1000oC) in bulk nano-engineered thermoelectric materials prepared using spark plasma synthesis (SPS). These materials are relevant for heat to electric conversion using radioisotope heat sources and from heating that occurs in high-speed aero-vehicles.

Bio: Dr. Rama Venkatasubramanian is the Chief Technologist, a Principal Staff Scientist and the Team Leader for energy and thermal management in the Research and Exploratory Development Department at the Johns Hopkins University - Applied Physics Lab. He leads a team whose work focuses on developing advanced solid-state energy conversion materials and devices for power generation, refrigeration, thermal management, and wearable applications. He is well known for pioneering atomically engineered superlattice materials and other nanoscale thermoelectric device innovations for a range of applications from hot-spot cooling in microelectronics to refrigeration (Nature 2001; Nature Nanotechnology 2009; Nature Biomedical Engineering 2023, Nature Communications 2025).

Dr. Venkatasubramanian is a Fellow of the IEEE, the American Association for the Advancement of Science, and the Johns Hopkins Extreme Materials Institute (HEMI). He served as an Editor for the IEEE Transactions on Electron Devices from 2011 to 2020. He has 25 issued U.S. patents, is the author or coauthor of over 100 peer-reviewed journal articles and conference publications, and has edited or contributed to 6 book chapters. Dr. Venkatasubramanian has received three R&D 100 Awards (2002, 2010, 2023) for nano-engineered thermoelectric materials, device advancement, and their applications. His areas of expertise include nano-engineered thin-film thermoelectric materials and devices, 2D materials, electronics and photonics thermal management, thermoelectric devices for outer-planetary missions and satellite applications, energy harvesting and cooling devices for haptics to hypersonic systems, cryogenic and biomedical device applications, multi-junction photovoltaic devices, optoelectronics, and related semiconductor materials and devices.

WEDNESDAY, JULY 9 **9:00AM–10:00AM**
WESTIMINSTER BALLROOM III, FIRST FLOOR

Dr. Joel Plawsky
Rensselaer Polytechnic Institute, Troy, NY

INTERFACIAL PHENOMENA IN A SIMPLE GLASS HEAT PIPE

Bio: Joel L. Plawsky is currently the department head of the Howard P. Isermann Department of Chemical and Biological Engineering at Rensselaer Polytechnic Institute. He received his B.S. in Chemical Engineering from the University of Michigan and his M.S.CEP and Sc.D. in Chemical Engineering from the Massachusetts Institute of Technology. After graduation, Joel worked optical fiber devices for Corning Inc. in their research division before returning to academia at Rensselaer Polytechnic Institute.

Joel's research interests lie in the area of applied transport phenomena. Most of his work has focused on thin films, with applications in the semiconductor, photonics, and thermal management industries but he has also worked with biofilms, two-phase, flow boiling, and liquid-liquid phase separating systems. Joel has supervised nine experiments aboard the International Space Station in the areas of advanced heat pipes, biofilm formation, flow boiling and is currently working on getting his tenth experiment ready for flight. Joel was a NASA Faculty Fellow in 1999 and 2000 and a visiting professor of chemical engineering at Delft University of Technology in 2002. While on sabbatical in 2003 at Marshal Space Flight Center, Joel worked on Shuttle tile repair formulations and thermal management systems for aerocapture. He is a fellow of the American Institute of Chemical Engineers and the American Society of Mechanical Engineers. He has served as the chairman of the Transport and Energy Processes Division of the American Institute of Chemical Engineers where he received the Herbie Epstein programming award for the 100th anniversary of chemical engineeing. Joel is also the author of a textbook, Transport Phenomena Fundamentals, 4th edition, published by CRC Press. He holds 11 patents in the areas of spouted bed technology for mixing, coating and water purification; photonic systems; thermal interface materials, flow boiling devices, and membranes.

Abstract: Heat pipes combine thermal conduction, liquid-vapor phase change, and in many designs, capillary flow, to transport energy efficiently between a heat source and a heat sink. They can be used for cooling microprocessors, keeping permafrost stable, and for thermal management of critical systems. Since, a heat pipe's fluid circulation is driven by interfacial forces, the devices operate without any moving parts, which makes them simple, light, and reliable: perfect for space exploration.

Transparent, wickless heat pipes of square cross-section have been operated in the microgravity environment aboard the International Space

Station off and on for the past 15 years. The original idea was to map the liquid-vapor interface and liquid film thickness profiles within the device and thereby understand the fluid flow and heat transfer characteristics of its operation in microgravity. Partly due to the low thermal conductivity of the glass walls, as heat inputs were increased, thermal Marangoni flows developed that offset the capillary return flows in the corners of the device. These offsetting flows flooded the heater end with liquid and caused liquid to also accumulate on the flat faces of the heat pipe in the form of a liquid drop. As the heat input was increased further, the drop ejected a stream of liquid out toward the heater end. This stream was a classic rip current, driven by two counterrotating vortices present in the drop. The formation of the current is a natural mechanism allowing the system to reject the increasing heat load when the normal modes of evaporation are cut off by the presence of strong Marangoni flows near the heated end of the device. In the shortest version of the heat pipe, we observed a form of slow-motion boiling, driven by vapor bubble nucleation at the heater end and strong Marangoni flows. The boiling phenomenon is only possible if the liquid film at the heater end exceeds a critical thickness. In the most recent version of the device, a 50:50 binary liquid mixture was used to offset the problematic thermal Marangoni flow. While the idea worked, the mixture also formed a cavity oscillator that was precise enough to serve as a rudimentary clock.

Keywords: Heat Pipe, Marangoni Stress, Capillary Flow, Rip current.

Joel L. Plawsky is currently the department head of the Howard P. Isermann Department of Chemical and Biological Engineering at Rensselaer Polytechnic Institute. He received his B.S. in Chemical Engineering from the University of Michigan and his M.S.CEP and Sc.D. in Chemical Engineering from the Massachusetts Institute of Technology. After graduation, Joel worked optical fiber devices for Corning Inc. in their research division before returning to academia at Rensselaer Polytechnic Institute.

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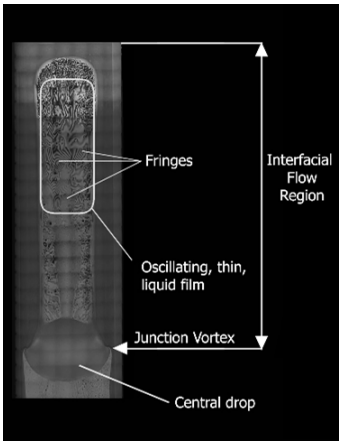

THURSDAY, JULY 10 **9:00AM–10:00AM**
WESTIMINSTER BALLROOM III, FIRST FLOOR

Thermal Engineering Challenges in High-Pressure Hydrogen Systems—From Thermophysical Property Measurements to the Development of a Dynamic Simulation for the Refueling Process

Yasuyuki (Yas) Takata
International Institute for Carbon-Neutral Energy Research (I2CNER), Kyushu University

Professor Yasuyuki Takata is a Distinguished Research Professor at International Institute for Carbon-Neutral Energy Research (I2CNER), Kyushu University. He is also Professor Emeritus at Kyushu University and Honorary Professor at the University of Edinburgh. He was a Professor in the Department of Mechanical Engineering, Kyushu University until March 2022. His research interests include two-phase flow and heat transfer, thermophysical properties of hydrogen at ultra-high pressure, micro refrigerator and micro heat transfer device and numerical simulation of thermal and fluid flow. He was the President of the Heat Transfer Society of Japan (HTSJ) from 2019 to 2020 and Japan Society of Thermophysical Properties in 2016. He served as the President of the Asian Union of Thermal Science and Engineering (AUTSE) from October 2020 to September 2022. He received numerous awards including the JSME Thermal Engineering Achievement Award in 2010, and ASME ICNMM2018 Outstanding Leadership Award in 2018 and Heat Transfer Society Award for Scientific Contribution in 2022. He is a Council Member of the Science Council of Japan since October 2

Abstract: Hydrogen has emerged as a crucial energy carrier for achieving a carbon-neutral society. Among its diverse applications, fuel cell vehicles (FCVs) are expanding rapidly. These vehicles store hydrogen at pressures of up to 82 MPa, while hydrogen refueling stations operate at even higher pressures, nearing 100 MPa, to enable refueling within three minutes. However, such rapid filling results in significant temperature rises within onboard tanks due to adiabatic compression, approaching the safety limit of 85°C. Although precooling is often employed to mitigate this temperature rise, it brings secondary issues such as post-fill pressure spikes and nozzle frosting. To address these challenges, we developed a high-accuracy thermophysical property database for hydrogen and incorporated it into a dynamic simulation (DS) tool for predicting transient behaviors during refueling. During the development and validation of this system, we encountered various hydrogen-specific phenomena, including measurement difficulties, sensor anomalies, material incompatibilities, and gas permeation effects. The present keynote presents and analyzes these challenges, offering valuable insights for the engineering and operation of high-pressure hydrogen systems.

ASME SYMPOSIUM CELEBRATING PROFESSOR VIJAY K. DHIR

SESSION 1 - TUESDAY, JULY 8 **10:20AM-12:00PM- |**
WESTMINSTER BALLROOM 1, FIRST FLOOR

SESSION 2 – TUESDAY, JULY 8 **1:30PM-3:10PM**
WESTMINSTER BALLROOM 1, FIRST FLOOR

SESSION 3: TUESDAY, JULY 8 **3:30PM–5:10PM**
WESTMINSTER BALLROOM 1, FIRST FLOOR

SESSION 4: WEDNESDAY, JULY 9 **10:20AM–12:00PM**
WESTMINSTER BALLROOM 1, FIRST FLOOR

SESSION 5: WEDNESDAY, JULY 9 **1:30PM–3:10PM**
WESTMINSTER BALLROOM 1, FIRST FLOOR

SESSION 6: WEDNESDAY, JULY 9 **3:30PM–5:10PM**
WESTMINSTER BALLROOM 1, FIRST FLOOR

Sponsored by the ASME Heat Transfer Division's Heat Transfer in Energy Systems (K6), Theory and Fundamental Research (K8), and Heat Transfer in Multiphase Flows (K13) committees, we are organizing this Symposium at the 2025 Summer Heat Transfer Conference (SHTC 2025) to celebrate the scholarly and professional contributions of Professor Vijay Dhir. Prof. Dhir is a Distinguished Professor Emeritus of Mechanical and Aerospace Engineering and the former Dean of the Henry Samueli School of Engineering and Applied Science at University of California, Los Angeles (UCLA), holding the position from March 2003 to January 2016.

Dr. Dhir leads the Boiling Heat Transfer Laboratory at UCLA and has conducted pioneering work in the fundamental and applied sciences involving boiling, an efficient process of heat removal. The lab has been involved in the study of flow boiling, microgravity boiling, nuclear reactor thermal hydraulics and safety, and water desalination. Notably, he was the principal investigator of the NASA-funded Boiling eXperiment Facility - Nucleate Pool Boiling eXperiment (BXF-NPBX), which was conducted in the micro-g environment aboard the International Space Station to understand bubble growth, detachment, and subsequent motion of single and large merged bubbles in micro-g. More than 46 Ph.D. students and 40 M.S. students have graduated under Dr. Dhir's supervision. He is the author or co-author of over 350 papers published in archival journals and conference proceedings. He has co-authored three books. Among his many honors and international recognitions, Prof. Dhir was elected a member of the U.S. National Academy of Engineering and of the European Academy of Sciences and Art. He also received several ASME awards including the Max Jakob Memorial Award, the Heat Transfer Memorial Award, and the 75th Anniversary Medal.

Topics of Interests

In honor of Prof. Dhir's broad contributions to thermal science and engineering, especially in phase change heat transfer and two-phase flows, the topics of this symposium encompass all areas of current and past heat transfer research. Selected papers from the symposium will be published in special issues of the ASME Journal of Heat and Mass Transfer.

Symposium Organizers:
Yongjie Hu, *UCLA*
Debjyoti Banerjee, *Texas A&M*
Laurent Pilon, *UCLA & ARPA-E*
Portonovo Ayyaswamy, *University of Pennsylvania*

90TH BIRTHDAY MEMORIAL SYMPOSIUM:

Celebrating the Legacy of Arthur E. Bergles

WEDNESDAY, JULY 9 **10:20AM–12:00PM AND 1:30PM–3:10PM**

LAKEHOUSE, OUTSIDE ON THE FIRST FLOOR

Advances in Process, Enhanced, and Phase-Change Heat and Mass Transfer: Celebrating the 90th Memorial Birthday of the Late Professor Arthur E. Bergles

Jointly sponsored by ASME and AIChE

Symposium Chair and Co-Chair:

Professor Raj M. Manglik, *Department of Mechanical and Materials Engineering, University of Cincinnati*

Professor Joel Plawsky, *Isermann Department of Chemical and Biological Engineering, Rensselaer Polytechnic Institute*

This 90th memorial birthday festschrift symposium will be the forum for technical presentations that address advances in the broad set of areas of heat and mass transfer where the Late Professor Arthur E. Bergles made many seminal and pathbreaking contributions. Art Bergles, with an illustrious career spanning over five decades, was perhaps one of the "tallest" colleagues in our professional community. His work, both fundamental and applied, has impacted nearly all areas of thermal science and transport phenomena. These topical areas include, among others, heat and mass transfer enhancement (or intensification or augmentation), pool and forced convection boiling, cooling of electronic and micro-electronic devices, single-phase forced convection, and process heat and mass transfer. Presentation submissions can be (1) original research or (2) a critical review that also insightfully addresses "unresolved questions" in the specific topic or (3) an insightful commentary on the state-of-the-art of a specific topic as listed.

Symposia

TIME	EVENT
MORNING	
10:20AM	Raj Manglik (U. Cincinnati) Introduction
10:40AM	Satish Kandlikar, RIT Respect the Bubble - It will Reveal the Enhancement Pathway!
11:00AM	Hongbin “Bill” Ma (U. Missouri) Phase Change Heat Transfer – From Fundamental Research to Commercial Products
11:20AM	Shankar Narayan, RPI Dynamics and Maldistribution in Flow Boiling Systems
11:40AM	Yogendra Joshi, Georgia Tech Contributions of Professor Bergles to Electronics Cooling
AFTERNOON	
1:30PM	Yasuyuki Takata, Kyushu University, Japan Effect of Wettability on Liquid-Vapor Phase Change
1:50PM	Sandra Boetcher, Embry-Riddle Aeronautical University Polymer Composite Heat Exchangers for Thermal Energy Storage
2:10PM	Srinath Ekkad, NC State University Impingement Cooling - What Else Can We Do With It?
2:30PM	Vijay Dhir, UCLA Enhancement of Maximum Heat Flux in Pool Boiling and Use of Swirl Flow to Enhance Single and Two-Phase Heat Transfer and in Desalination
2:50PM	Prashant Singh, U. Tennessee Enhancing Particle-side Heat Transfer in Particle-to-sCO2 Heat Exchangers for CSP Applications
3:10PM	Joel Plawsky, RPI Brief Final Remarks

Organizers:
Raj Manglik, *University of Cincinnati*
Joel Plawsky, *RPI, Organizer*

Presenters:
Vijay Dhir, *UCLA*
Yasuyuki Takata, *Kyushu University, Japan*
Hongbin “Bill” M
Satish Kandlikar, *RIT*
Srinath Ekkad
Yogendra Joshi, *Georgia Tech*
Sandra Boetcher, *Embry-Riddle*
Prashant Singh, *University of Tennessee*
Shankar Narayan, *RPI*

Arthur E. Bergles

The late Professor Arthur E. Bergles (9th August 1935–17th March 2014) would’ve turned 90-years-old this year (2025). His formal schooling began at a one-room schoolhouse, and subsequently at the Rhinebeck Central School System from where he graduated as a valedictorian and earned his Eagle Scout. In 1953, he joined Massachusetts Institute of Technology (MIT) where he received the combined SB and SM (1958), and Ph.D. (1962) degrees in Mechanical Engineering. Art began his professional academic career at MIT in 1962, first as Research Staff at the National Magnet Laboratory, and then in 1963 as faculty in Mechanical Engineering and as the Ford Assistant Professor. He was also the Associate Director of the Heat Transfer Laboratory, and Chairman of the Engineering Projects Laboratory. After a seven-year stint at MIT, he moved to Georgia Tech as Professor in 1969. He moved again in 1972 to become the Chair of Mechanical Engineering at ISU, where he was later named the Anson-Marston Distinguished Professor of Engineering in 1981. He stepped down

as chair in 1983 but continued to direct the Heat Transfer Laboratory at ISU until his next move in 1986 to RPI. He was appointed Clark and Crossan Professor of Engineering and later served as Dean of Engineering (1989–1992). Art's research expertise spanned enhanced heat transfer, multi-phase processes including boiling, electronics cooling, among others. In enhanced heat transfer, he not only played a pivotal role in enunciating its research imperative and advocating widespread adoption of the technology but also contributed extensively with seminal and groundbreaking research. Art was elected NAE (1992), Polish Society of Theoretical and Applied Mechanics (1987), Union of Mechanical and Electrical Engineers and Technicians of Yugoslavia (1993), UK Royal Academy of Engineering (2000), Academy of Sciences and Arts of Slovenia (2001), and Italian National Academy of Sciences (2003). Moreover, he was recognized by some the highest award of ASME, AAAS, AIChE, ASEE, and ASHRAE.

Abstracts

Introduction

Raj Manglik
University of Cincinnati
Cincinnati, OH

This talk will briefly discuss the arc of Art Bergles career, his major accomplishments and the legacy he left to the heat transfer community. The art and science of heat transfer enhancement is now a ubiquitous endeavor in not only the laboratories and computer simulation rooms of researchers across the globe, but with practitioners as well in their quest for new technology transfer avenues and engineering applications. This explosive growth is underscored by the present-day "Energy-Water Nexus" crisis, the advent of artificial intelligence that consumes prodigious amounts of power, and the challenges of energy storage systems that warrant, among other solutions, greater need for new research in and implementation of heat and mass transfer enhancement techniques.

Dynamics and Maldistribution in Flow Boiling Systems

Shankar Narayan
RPI
Troy, NY

This talk will present how time-dependent operating conditions influence flow boiling behavior in microchannel and parallel-channel systems. The origins of dynamic instabilities, such as pressure drop oscillations and flow maldistribution, will be discussed, with an emphasis on how system parameters can drive or suppress these phenomena. A thermodynamic perspective based on entropy generation will be introduced to explain why maldistributed flows may be favored over uniform distributions. These insights aim to reveal the fundamental physics governing instability and non-uniformity in flow boiling systems.

Phase Change Heat Transfer – From Fundamental Research to Commercial Products

Hongbin Bill Ma
Chair and Curators' Distinguished Professor
Director, Multiphysics Energy Research Center (MERC)
Department of Mechanical & Aerospace Engineering
University of Missouri
Columbia, MO 65211
University of Missouri

Phase-change heat transfer involves both evaporation and condensation. When these two mechanisms are integrated into a device using capillary-driven forces to link the evaporation and condensation processes, the device is referred to as a conventional capillary-driven heat pipe. If the connection is established through thermally induced oscillations, the device is known as an oscillating heat pipe. Evaporation occurs at a higher temperature and pressure, while condensation takes place at a lower temperature and pressure. If a converging-diverging nozzle is introduced between these two regions to produce a supersonic flow, the device is called an ejector, which can pump thermal energy from the ambient air into the system. Conventional heat pipes, oscillating heat pipes, and ejector heat pumps are all closed systems in terms of the working fluid, utilizing phase-change processes to transfer thermal energy from one location to another. If the system enables energy recycling and circulating as a closed system in terms of energy and allows the working fluid (such as water) to be extracted from one location and delivered to another, it becomes a highly efficient wood dryer. This presentation demonstrates how fundamental research on phase-change heat transfer can be translated into commercial products, using examples such as Burnout coffee mugs, oscillating heat pipes, ejector heat pumps, and wood dryers.

Effect of Wettability on Liquid-Vapor Phase Change

Yasuyuki Takata
International Institute for Carbon-Neutral Energy Research, Kyushu University
E-mail: takata@mech.kyushu-u.ac.jp

Surface wettability plays a crucial role in liquid–vapor phase change phenomena. It is typically characterized by the static contact angle, with hydrophilic surfaces (low contact angle) and hydrophobic surfaces (high contact angle) exhibiting distinct effects on phase change heat transfer. For instance, hydrophilic surfaces are advantageous in enhancing the critical heat flux (CHF) during boiling and in accelerating quenching in spray cooling on high-temperature surfaces. Conversely, hydrophobic surfaces promote early onset of boiling and facilitate dropwise condensation. By tailoring surface wettability, significant improvements in heat transfer performance can be achieved. This presentation introduces experimental investigations on the modification of surface wettability using ultraviolet irradiation, plasma treatment, and thermal cycling, and discusses the resulting effects on nucleate boiling and droplet evaporation behavior.

Enhancement of Maximum Heat Flux in Pool Boiling and Use of Swirl Flow to Enhance Single and Two-Phase Heat Transfer and in Desalination

V. K. Dhir
School of Engineering and Applied Science UCLA

Maximum heat flux in pool boiling is shown to depend on the size of the surface. Swirl

flow concept developed in 1980s to separate vapor and liquid from a two-phase mixture in

microgravity has been used to enhance single- and two-phase heat transfer.

More recently the concept has been utilized in desalination of water. Results from these studies will be briefly discussed in this talk.

Enhancing particle-side heat transfer in particle-to-sCO2 heat exchangers for CSP applications

Prashant Singh
Mechanical, Aerospace & Biomedical Engineering"
University of Tennessee, Knoxville

Particle-to-sCO2 heat exchangers are identified as one of the most crucial components which require innovations to achieve competitive levelized cost of electricity (LCoE) metric for concentrating solar power (CSP) plants. Conventional heat exchangers involve gravity-driven moving packed bed (MPB) of particles between vertically oriented parallel plates, which yield low convective transport due to inherently low thermal conductivity of MPB and minimal contact of particles with the parallel plates. In this talk, we will present advanced heat transfer concepts to enhance the particle-side convective heat transfer through the integration of parallel plates with unique additively manufactured lattice structures. The flow and thermal transport characteristics of MPB through lattice structures will be discussed based on quasi steady-state heat transfer and optical flow experiments conducted on a particle elevator and heat exchanger test facility. Apart from MPB heat exchangers, fluidized bed heat transfer systems will also be discussed for CSP applications involving power generation and process heat production.

Respect the Bubble – It will reveal the Enhancement Pathway!

Satish G. Kandlikar
Rochester Institute of Technology
Rochester, NY

Individual bubbles hold the key to their trajectory after nucleation at the heater surface. Removing vapor, inducing liquid currents, interacting with the heater surface and enhancing interface evaporation are some of the features that become apparent after critically evaluating individual bubble growth and its motion. Studying individual bubbles can provide insight into how the bubbles interact with surface modification, enhancement structures and texturing. Restricting bubble motion in any way can cause the bubble to react by raising its internal pressure and the corresponding saturation temperature leading to degradation in heat transfer coefficient. Providing efficient pathways avoids bubble coalescence followed by their hovering over the heater surface causing early critical heat flux. The talk will highlight these mechanistic behaviors and how they can point towards an enhanced future!

PANEL ON INVERSE PROBLEMS IN HEAT TRANSFER: INSIGHTS FROM ICIPE 2024 - ADVANCES IN METHODOLOGY & APPLICATIONS

TUESDAY, JULY 8 **8:00AM–9:00AM**
WESTMINSTER BALLROOM III, FIRST FLOOR

Panel Discussion: Inverse Problems in Heat Transfer: Insights from ICIPE 2024 – Advances in Methodology & Applications
Organized by the Computational Heat Transfer Technical Committee (K20)
This 90-minute panel discussion will explore recent advances in solving inverse heat transfer problems, with a focus on key insights from the International Conference on Inverse Problems in Engineering (ICIPE 2024), held in Brazil in June 2024. As the flagship event in the field, ICIPE brings together leading researchers and practitioners every three years to discuss the latest developments in inverse methods for engineering applications.
The panel session will highlight emerging methodologies, computational strategies, and real-world applications across industries such as thermal management of electronics, energy systems, aerospace, and non-destructive testing. The panelists, who participated in ICIPE 2024 with support from the National Science Foundation (NSF), will share their perspectives on the state of the field and future directions.
Topics of discussion will include:

- Introduction to Inverse Problems in Heat Transfer – Concepts, challenges, and applications
- Key Takeaways from ICIPE 2024: Notable findings and emerging research directions
- AI/ML Techniques for Solving Inverse Heat Transfer Problems
- Physics-Informed Neural Networks (PINNs) for Heat Transfer Applications – Bridging physics-based and machine learning models
- Applications and Case Studies

This session will provide valuable insights for researchers, engineers, and practitioners working in heat transfer, computational modeling, and related fields.

Presenters/Panelists

Keith Woodbury, *Ph.D.*
Professor Emeritus of Mechanical Engineering
University of Alabama

Hamidreza Najafi, Ph.D.
Associate Professor of Mechanical Engineering
Florida Institute of Technology

Benjamin Kubwimana, M.Sc.
Senior Software Engineer
NVIDIA

Forooza Samadi, Ph.D.
Assistant Professor of Mechanical Engineering
University of Alabama

K8–PANEL 1: PANEL ON FUNDAMENTALS OF MACHINE LEARNING FOR HEAT TRANSFER

TUESDAY, JULY 8 **1:30PM–3:10PM**
GRAY'S PEAK, FIRST FLOOR

The Panel on Fundamentals of Machine Learning for Heat Transfer showcases emerging research and opportunity that leverage machine learning to help us understand thermal transport phenomena and design better heat transfer materials, devices, and systems. Topics include but are not limited to: machine learning-accelerated design and optimization, machine learning-accelerated solution of transport phenomena, new machine learning methods driven by heat transfer needs, etc.

Moderators:
Prof. Van Carey, *University of California, Berkeley*
Prof. Xiulin Ruan, *Purdue University*

Panelists:
Prof. Jay Gore, *Mechanical Engineering, Purdue University*
Prof. Ming Hu, *Mechanical Engineering, University of South Carolina*
Prof. Justin Weibel, *Mechanical Engineering, Purdue University*
Prof. Hyeongyun Cha, *Mechanical and Aerospace Engineering, University at Buffalo*

K8–PANEL 2: PANEL ON FUNDAMENTALS AND APPLICATIONS OF SEMICONDUCTOR THERMAL MANAGEMENT

WEDNESDAY, JULY9 **1:30PM–3:10PM**
GRAY'S PEAK, FIRST FLOOR

Organizing Committee: K8
Chair: Prof. Xiulin Ruan

Panel Moderators:
Prof. Vaibhav Bahadur, *University of Texas, Austin*
Prof. Amitabh Narain, *Michigan Technological University*

Panelists:
Dr. Kaushik Mysore, *Principal Member of Technical Staff (Thermal Packaging and Advanced Technology Integration), Advanced Micro Devices, Inc. (AMD)*
Prof. David Cahill, *Materials Science and Engineering, University of Illinois, Urbana-Champaign*
Prof. Satish Kandlikar, *Mechanical Engineering, Rochester Institute of Technology*
Prof. Amitabh Narain, *Mechanical Engineering, Michigan Technological University*

This interactive panel aims to create a vibrant platform for exchanging ideas and insights on cutting-edge advancements and pressing challenges in the field of semiconductor thermal management. This topic is of critical relevance to the semiconductor industry as continued advancements in the AI ecosystem are strongly contingent on effective thermal management at various length scales. The panelists (mix of industry and academia) will explore a diverse array of topics in the context of AI-driven computing advancements that are pushing the development of next-generation xPUs (GPU, CPU, etc.) with large thermal power dissipation (700–2000 W per xPU), and data centers approaching heat dissipation requirements of 1 MW per rack. Accordingly, advancements like thermal interface materials (TIM)-free interfaces and high heat flux liquid cooling (Direct-to-Chip, Immersion, and Hybrid), etc., are becoming cornerstone technologies for thermal management.

The panelists will explore a diverse array of topics relevant to cooling and thermal management, from chip to data center levels. At the chip and package levels, challenges related to 3D metrology, low interfacial resistances, high thermal conductivity heat spreaders, bonded interfaces between semiconductors, phase change-based cooling, and composite thermal interface materials will be discussed. At the data center level, the state of the market, emerging technologies, evolving business models, and the opportunities and challenges shaping the future of data center cooling will be discussed.

This panel will be advertised across ASME to encourage attendance from attendees of other SHTC sessions. To promote dynamic and engaging interactions, the presentations will be interspersed with lively discussions involving both the panelists and the audience.

BERGLES-ROHSENOW YOUNG INVESTIGATOR AWARD IN HEAT TRANSFER

WEDNESDAY, JULY 9 **12:00PM–1:30PM**
WESTMINSTER BALLROOM III & IV, FIRST FLOOR

Prashant Singh,
University of Tennessee, Knoxville, TX

Dr. Prashant Singh is currently a tenure-track assistant professor of mechanical engineering at the University of Tennessee, Knoxville (UTK). He received his Ph.D. in Mechanical engineering from Virginia Tech in 2017. During his tenure-track appointments at UTK (2022–present) and Mississippi State University (2019–2022), he has secured over $3M of external funding. Dr. Singh has received 11 externally funded grants from DOE, NSF, NASA, and ORAU in the past six years. He has graduated two Ph.D. and one M.S. student and currently supervises one post-doc, three Ph.D. students, and a visiting Ph.D. student. His research efforts have resulted in over 70 peer-reviewed articles in the tenure-track period (past six years), which includes over 50 journal articles. In total, Dr. Singh has published over 125 research articles, which includes 74 journal papers, three book chapters, and 50 peer-reviewed conference articles. His research efforts have been recognized through Ralph E. Powe Junior Faculty Enhancement award from ORAU, and departmental scholarly, teaching, and research accomplishment awards from MSU and UTK. He has contributed to ASME in various capacities of session organizer in SHTC, IMECE, IGTI, member of K-10 and K-14 committees in HTD, K-10 committee vice-chair (2021–2024), and K-10 committee chair (2025–present).

ASME HEAT TRANSFER MEMORIAL AWARD – SCIENCE

WEDNESDAY, JULY 9 **12:00PM–1:30PM**
WESTMINSTER BALLROOM III & IV, FIRST FLOOR

Yasuyuki Takata,
Professor, International Institute for Carbon-Neutral Energy Research, Kyushu University, Motooka Nishi-ku, Fukuoka

Yasuyuki Takata is Professor Emeritus and Specially-Appointed Professor at the International Institute for Carbon-Neutral Energy Research (I^2CNER), Kyushu University, and Honorary Professor at the Institute for Multiscale Thermofluids, the University of Edinburgh. After earning his Ph.D. from Kyushu University in 1984, he began his academic career as a Lecturer in the Department of Mechanical Engineering, advancing to Associate Professor in 1986 and Professor in 2003. He served in leadership roles including Associate Director of I^2CNER and Department Head of

Mechanical Engineering. His research interests include two-phase flow and heat transfer, thermophysical properties of hydrogen under ultra-high pressure, micro-refrigerators, micro heat transfer devices, and numerical simulation of thermal-fluid phenomena. He has actively contributed to major academic societies, serving as Council Member of the Science Council of Japan, Fellow, Honorary Member, and Thermal Engineering Division Head of the Japan Society of Mechanical Engineers (JSME), and President of both the Heat Transfer Society of Japan (HTSJ) and the Japan Society of Thermophysical Properties (JSTP). Internationally, he served as President of the Asian Union of Thermal Science and Engineering (AUTSE), promoting global collaboration in thermal sciences.

ASME HEAT TRANSFER MEMORIAL AWARD – ART

WEDNESDAY, JULY 9 **12:00PM-1:30PM**
WESTMINSTER BALLROOM III & IV, FIRST FLOOR

Hongbin Ma,
Professor, University of Missouri, Columbia, MO

Dr. Hongbin Ma is a globally recognized expert in thermal science, with contributions to both fundamental research and engineering applications. He has advanced the understanding of phase change heat transfer, supersonic flow, and thermally excited oscillation heat transfer, as well as pioneering innovations in heat pipes, oscillating heat pipes (OHPs), and phase-change thermal systems. As founder and president of ThermAvant Technologies, Dr. Ma commercialized OHPs, earning a prestigious R&D 100 Award. His inventions—including advanced thermal coffee mugs and energy-efficient wood dryers—demonstrate real-world impact. With over 190 journal publications, 15 patents, and sustained funding from NSF, DARPA, ONR, and major corporations, he has established himself as a prolific and influential researcher. Currently, Dr. Ma serves as Chair and Curators' Distinguished Professor in Mechanical and Aerospace Engineering at the University of Missouri, where he directs the Multiphysics Energy Research Center. He is also actively engaged in national and international technical communities, editorial boards, and conference leadership roles. He was selected as a Fellow of both the National Academy of Inventors and ASME.

ASME HEAT TRANSFER MEMORIAL AWARD – GENERAL

WEDNESDAY, JULY 9 **12:00PM–1:30PM**
WESTMINSTER BALLROOM III & IV, FIRST FLOOR

S. A. Sherif,
Professor, University of Florida, Gainesville, FL

Dr. S.A. Sherif is a tenured Professor of Mechanical and Aerospace Engineering at the University of Florida. He is the Founding Director of the Wayne K. and Lyla L. Masur HVAC Laboratory, the Director of the UF Industrial Training and Assessment Center, and the Director of the UF Mobile Energy Laboratory. He served as Co-Director of the Southeastern Center for Industrial Energy Intensity Reduction from 2009 to 2013. He is a Life Fellow of ASME, a Life Fellow of ASHRAE, a Fellow of the Royal Aeronautical Society, a Fellow of the American Society of Thermal and Fluids Engineers (ASTFE), an Associate Fellow of AIAA, a Vice President of Commission B-2 of the International Institute of Refrigeration, and a Member of the Board of Directors of the International Association for Hydrogen Energy. He served as Editor-in-Chief of the ASME Journal of Thermal Science and Engineering Applications (2014–2019) and as Editor-in-Chief of the ASME Journal of Solar Energy Engineering (2020–2028). He is an ABET Program Evaluator (PEV) in Mechanical Engineering (2019–2029). Dr. Sherif has one book, 24 book chapters, 400 refereed papers, 250 technical reports, and two U.S. patents.

JAMES HARRY POTTER GOLD MEDAL

WEDNESDAY, JULY 9 **12:00PM–1:30PM**
WESTMINSTER BALLROOM III & IV, FIRST FLOOR

Jay P. Gore,
Reilly University Chair, Professor of Combustion Engineering Purdue University, West Lafayette, IN

Jay Gore has served as the Associate Dean for Research and Entrepreneurship in the College of Engineering and Director of the Energy Center in Discovery Park at Purdue University. He has taught Thermodynamics at the undergraduate level and Combustion at the graduate level for over three decades. Professor Gore has developed a new graduate course in Artificial Intelligence in Thermal Systems. He has advised the doctoral dissertations of more than 35 and the MS theses of more than 50 students. Professor Gore and collaborators have discovered and quantified: the effects of turbulent fluctuations on thermal radiation heat fluxes from flames; the optimum levels of partial premixing for minimization of emission indices of oxides of nitrogen; the mechanisms of flame stabilization following oil and gas well blowouts; and the mechanisms of lean blow out and of hot surface ignition in gas turbine combustors. In 2023, Professor Gore delivered the Arden Bement

Lecture following competitive selection across the Purdue University campus. He spoke about his research in optimizing the exergy efficiency for minimization of both the carbon footprint and the cost of operations of a coal burning power plant using Artificial Intelligence.

GEORGE WESTINGHOUSE GOLD MEDAL

WEDNESDAY, JULY 9 **12:00PM–1:30PM**
WESTMINSTER BALLROOM III & IV, FIRST FLOOR

Kai Hong Luo,
Professor, University College London (UCL), United Kingdom

Dr. Kai Luo has made outstanding and continued contributions to power engineering through research, innovation, education, and leadership. He is an international authority in both physics-based and data-driven modeling and simulation across atomic, micro-, meso-, and macroscales that has had significant impact on analysis, prediction, design, and optimization in power engineering. He led the UK Consortium on Computational Combustion for Engineering Applications (UKCCCEA) for 10 years, developing high-fidelity computational fluid dynamics (CFD) tools that have been widely used in academia and industry especially the energy and power sectors. With remarkable foresight, he founded and has led the UK Consortium on Mesoscale Engineering Sciences (UKCOMES) since 2013. He and co-workers have developed advanced and impactful mesoscopic and atomistic modeling and simulation methods and codes that have been adopted in commercial and open-source software. These tools have been used by academic and industrial communities worldwide to tackle wide-ranging applications from nanofuels to catalytic reactors and batteries, generating both industrial and economic impacts. Moreover, he provides strategic inputs to engineering policies on net-zero energy and power, AI, digital infrastructure and digital economy, etc., as a member of the National Engineering Policy Centre Committee of the Royal Academy of Engineering.

AICHE – ASME DONALD Q. KERN AWARD AND LECTURE

THURSDAY, JULY 10 **9:00AM–10:00AM**
WESTMINSTER BALLROOM III, FIRST FLOOR

Joel L. Plawsky,
Rensselaer Polytechnic Institute, Troy, NY

Joel L. Plawsky is currently the department head of the Howard P. Isermann Department of Chemical and Biological Engineering at Rensselaer Polytechnic Institute. He received his B.S. in Chemical Engineering from the University of Michigan and his M.S.CEP and Sc.D. in Chemical Engineering from the Massachusetts Institute of Technology. After graduation, Joel worked optical fiber devices for Corning Inc. in their research division before returning to academia at Rensselaer Polytechnic Institute. Joel's research interests lie in the area of applied transport phenomena. Most of his work has focused on thin films, with applications in the semiconductor, photonics, and thermal management industries but he has also worked with biofilms, two-phase, flow boiling, and liquid-liquid phase separating systems. Joel has supervised nine experiments aboard the International Space Station in the areas of advanced heat pipes, biofilm formation, flow boiling and is currently working on getting his tenth experiment ready for flight. Joel was a NASA Faculty Fellow in 1999 and 2000 and a visiting professor of chemical engineering at Delft University of Technology in 2002. While on sabbatical in 2003 at Marshal Space Flight Center, Joel worked on Shuttle tile repair formulations and thermal management systems for aerocapture. He is a fellow of the American Institute of Chemical Engineers and the American Society of Mechanical Engineers. He has served as the chairman of the Transport and Energy Processes Division of the American Institute of Chemical Engineers where he received the Herbie Epstein programming award for the 100th anniversary of chemical engineering. Joel is also the author of a textbook, Transport Phenomena Fundamentals, 4th edition, published by CRC Press. He holds 11 patents in the areas of spouted bed technology for mixing, coating, and water purification; photonic systems; thermal interface materials; flow boiling devices; and membranes.

2025 HEAT TRANSFER DIVISION AND AICHE – ASME AWARDSBOELTER-MCADAMS PRIZE

Professor Shankar Narayan,
Rensselaer Polytechnic Institute, Troy, NY

For advancing the field of heat and mass transfer through research focusing on phase-change processes occurring in nanostructures, resulting in numerous high-impact publications and patents that have significantly influenced applications like thermal management, water harvesting, and thermal energy storage.

AICHE – ASME DONALD Q. KERN AWARD

Professor Joel L. Plawsky,
Chemical and Biological Engineering, Rensselaer Polytechnic Institute, Troy, NY

For fundamental advancements in interfacial heat and mass transfer with applications to thermal management, porous dielectrics, membranes, and microgravity science.

SHTC 2025 features two activities dedicated to students including a Newcomers Social and a Career Panel. These activities will be available to all student participants at no additional cost.

SHTC AND ES NEWCOMER SOCIAL

TUESDAY, JULY 8 **10:00AM–10:20AM**
WESTMINSTER BALLROOM III, FIRST FLOOR

Cost: Complimentary

All first-time attendees of the Summer Heat Transfer Conference (including students) are invited to attend a brief social with conference organizers and other new attendees. A brief presentation will focus on how to get the most out of your conference experience. Grab a beverage from the coffee break and join us to meet other first time attendees!

STUDENT CAREER PANEL – NEED UPDATED PANELIST AND BRIEF DESCRIPTION

TUESDAY, JULY 8 **5:20PM–6:20PM**
GRAY'S PEAK, FIRST FLOOR

Panelists from academia, industry and national laboratory positions will discuss their career paths, compare a typical workday in academia, industry and national laboratory positions and answer student's questions regrading career decisions.

Panelists:
Dr. Brian Iverson, *Brigham Young University*
Dr. Heejin Cho, *University of Nevada, Las Vegas*
Dr. Alon Lidor, *National Renewable Energy Laboratory*
Dr. Amulya Nimmagadda, *Cache Energy*
Natalie Douglass, *Blue Origin*

CAN BE FOUND IN THE CONFERENCE APPLICATION (APP).

STUDENT POSTER SESSION

TUESDAY, JULY 8 **12:00PM–1:30PM**
LEGACY BALLROOM, FIRST FLOOR

LAST NAME	FIRST NAME	SUBMISSION CODE	SUBMISSION NAME
Abate	Lijalem Ayele	156193	Experimental Investigation and Numerical Analysis of Temperature and Relative Humidity Distribution for Cold Storage to Reduce Shelf Life Loss of Vegetables on Sub-Sahara Regions
Abedien	Tanvirul	169945	Impact of Nano Hotspot Size on Thermal Boundary Conductance (TBC): A Molecular Dynamics Study
Adnan	Khalid Zobaid	169916	Thermal Boundary Conductance and Thermal Conductivity Strongly Depend on Nearby Environment
Aldeia Machado	Luiz	156862	Toward Development of a Low-Temperature Failure Envelope of Cases for High-Burnup Rias Under Pwr Operational Conditions.
Bairwa	Avinash	167568	Performance Enhancement of Cold Plates by Simultaneous Topology and Thermal Power Map Optimization
Day	Ryan	164016	Development of a Microfluidic Isothermal Titration Calorimeter
Deshpande	Prathamesh	168572	Effect of AC Electric Fields on Bubble Dynamics and Liquid-Vapor Interface
Ignuta-Ciuncanu	Matei-Cristian	167699	Generative Constructal Design of Thermal Flow Systems
Irsyad	Achmad Rofi	160707	Effect of Pigment Concentration on Inkjet Droplet Penetration and Evaporation Dynamics on Porous Polymer Sheet
Kalantari Dehaghi	Alireza	156861	The Near-Field Photon Nernst Effect: Nonreciprocal Radiative Heat Transfer for Efficient Thermal Energy Conversion
Kil	Min Jong	165091	Photo-Synthesized Cylindrical Graphite for Thermal Interface Materials on Silicon Dioxide
Koomson	Alfred	169943	Numerical Investigation of Different PCM Container Geometries for Optimizing Thermal Performance in High-Efficiency Refrigerators
Lopes	Nicholas C.	164991	Effects of Tube Diameter and Hydrodynamic Development on Supercritical CO_2 Heat Transfer
Padia	Vineet	156873	Sustainable Cellulose Nanofoams: Advancing Customization, Thermal Performance, and Scalable Fabrication for Multifunctional Applications
Rahmatullah	Yusuf	164341	Lee-Model Based Numerical Method for Efficient Vapor Chamber Simulations
Stamler	Natasha	152275	The Impact of Airborne Hydrocarbon Adsorption on the Surface Wettability and Heat Transfer Performance of Metal Condensers
Vydyula	Parimala Vardhan	169717	A Modeling Framework for Nucleate Pool Boiling Based on Heat Flux Partitioning
Zhang	Xian	169895	Thermal Behaviors of Tailored Graphene Under Mechanical Strains
Zhang	Xuguang	156614	Innovative Fiberglass Cast for Passive Radiative Cooling Applications
Zhang	Zhenong	156787	Direct Observation of Broadband Nonreciprocal Thermal Emission With High Contrast
Ziar	Yassin	162844	Optimising Heat Transfer Architecture for Solid-State Hydrogen Storage Systems

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Abate	Lijalem Ayele	156193	Experimental Investigation and Numerical Analysis of Temperature and Relative Humidity Distribution for Cold Storage to Reduce Shelf Life Loss of Vegetables on Sub-Sahara Regions	SHTC Poster Presentations	Tuesday, July 8, 2025
Abdalla	Ahmad	156630	Enhancing HVAC Efficiency Through Seasonal Separate Sensible and Latent Cooling in Hot and Humid Climates	K10-01: Heat Transfer Equipment	Tuesday, July 8, 2025
Abdelkareem	Mohamed	157684	Enhancement of sCO2 Heat Transfer Near the Critical Point Using a Twisted Elliptical Mini Tube	K13-01: Flow Boiling I	Wednesday, July 9, 2025
Abedien	Tanvirul	169933	Non-Fourier Thermal Transport Near Nano Hotspot: A Comparison Between Molecular Dynamics (Md) and Finite Element Method (FEM)	K9-05: Nanoscale Thermal Transport Theory	Wednesday, July 9, 2025
Abedien	Tanvirul	169945	Impact of Nano Hotspot Size on Thermal Boundary Conductance (TBC): A Molecular Dynamics Study	SHTC Poster Presentations	Tuesday, July 8, 2025
Abuhasheh	Mayyadah	156643	Parametric Analysis of Single-Phase Direct-to-Chip Cooling for High-Density Data Centers: for Aerospace Application	K12-02: Aerosapce Heat Transfer-II	Tuesday, July 8, 2025
Acosta	Greg	169813	Investigation of Near-Field Radiative Heat Transfer With MoS2	K9-07: Near-Field Thermal Radiation	Thursday, July 10, 2025
Adams	Michael	170049	Degradation of Thermochemical Energy Storage Materials in Kinetic- and Diffusion-Limited Reactions	K6-10: Thermal Energy Storage Symposium II	Thursday, July 10, 2025
Adnan	Khalid Zobaid	169916	Thermal Boundary Conductance and Thermal Conductivity Strongly Depend on Nearby Environment	SHTC Poster Presentations	Tuesday, July 8, 2025
Adnan	Khalid Zobaid	169942	Thermal Boundary Conductance of Metal–diamond Interfaces Predicted by Machine Learning Interatomic Potentials	K9-03: Interfacial Thermal Transport	Wednesday, July 9, 2025
Aflatounian	Shayan	158270	Evaluating Multi-Layer Insulation Performance Under Compression for Cryogen-Free Ultra-High Field Superconducting Electric Motors	K12-01: Aerosapce Heat Transfer-I	Tuesday, July 8, 2025
Aktas	Murat	156584	Hybrid Cooling Plate Design for an EV Battery Module	K16-02: Heat Transfer In Electronic Equipment II	Tuesday, July 8, 2025
Al Sotary	Omar Hasan	156088	Evaluating R410A and R513A as Alternative Refrigerants in Aerospace Thermal Management Applications	K12-01: Aerosapce Heat Transfer-I	Tuesday, July 8, 2025
Al-Ameri	Bakir	169898	Near-Field Radiative Heat Transfer Between Highly Anisotropic Surfaces	K9-07: Near-Field Thermal Radiation	Thursday, July 10, 2025

LAST NAME	FIRST NAME	SUBMISSION CODE	SUBMISSION NAME	TRACK/SESSION	DATE
Aldeia Machado	Luiz	156676	Toward the Use of Machine Learning Models in the Aid of Predictive Maintenance of Nuclear Reactors	K20-07: Computational Heat Transfer for Energy	Thursday, July 10, 2025
Aldeia Machado	Luiz	156862	Toward Development of a Low-Temperature Failure Envelope of Cases for High-Burnup Rias Under Pwr Operational Conditions.	SHTC Poster Presentations	Tuesday, July 8, 2025
Ali	Mohamed	156434	Tilt Angle and Aspect Ratio Effect on Natural Convection Heat Transfer Inside Square Enclosures Filled With Al2O3 Water Nanofluid	K8-05: Fundamentals of Single Phase Convection or Multiphysics Transport	Thursday, July 10, 2025
Alkalbani	Omar	156706	Thermochemical Pathway Along With Material Recovery to Support Technoeconomic PV Recycling	K15-02: Transport Phenomena in Manufacturing and Energy Manufacturing I	Thursday, July 10, 2025
Altaii	Karim	155536	The Development of a Predictive Model for a Prototype Atmospheric Water Generator	K6-01: Heat Transfer In Energy System - Waste Heat I	Tuesday, July 8, 2025
Amin Khan	Tariq	156674	Performance Analysis of Partially Blocked Car Radiator	K20-08: Computational Heat Transfer: Applications	Thursday, July 10, 2025
Arbousset	Samuel	156471	Enhancing System Efficiency Through Topological Design of Heat Exchangers	K20-04: Computational Heat Transfer for Energy	Wednesday, July 9, 2025
Atayo	Asonganyi	156880	Computational Investigation of Heat Generation and Dissipation in Lithium-Ion Batteries During Multi-Rate Charging	K6-05: Heat Transfer In Energy System - Thermal and Electrochemical Energy Storage I	Wednesday, July 9, 2025
Ayyaswamy	Portonovo	163812	Computational Modeling of the Motion of a Nano-Sized Particle in Unbounded and Confined Pressure-Driven Flows: Application in Targeted Drug Delivery	ASME Symposium Celebrating Professor Vijay K. Dhir 3	Tuesday, July 8, 2025
Bairwa	Avinash	164739	A Framework for Simultaneous Topology and Flow Inlet/outlet Location Co-Optimization for Cold Plate Design	K16-03: Heat Transfer In Electronic Equipment III	Wednesday, July 9, 2025
Bairwa	Avinash	167568	Performance Enhancement of Cold Plates by Simultaneous Topology and Thermal Power Map Optimization	SHTC Poster Presentations	Tuesday, July 8, 2025
Bandyopadhyay	Saumyadwip	165551	Enhanced Critical Heat Flux and Heat Transfer Coefficient on a Copper Hybrid Pillar Array Surface	K8-04: Fundamentals of Phase Change including Micro/Nanoscale Effects	Thursday, July 10, 2025
Banerjee	Debjyoti	156914	Corrosion Mitigation of Metallic and Alloy Substrates Using Nanofluids Based Coolants	K9-10: Nanoscale Evaporation and Nanofluids	Thursday, July 10, 2025

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Banerjee	Debjyoti	167508	Nano Fin Effect (NFE): Thermal Interfacial Diode and the Ba Number	K8-03: Fundamentals of Phase Change including Micro/ Nanoscale Effects	Wednesday, July 9, 2025
Barbosa	Erik	169417	Inter- and Intraparticle Heat and Mass Transfer of Thermochemical Reactions of Salt Hydrates in a Packed Bed Reactor	K6-09: Thermal Energy Storage Symposium I	Thursday, July 10, 2025
Bates	Jakob G.	155305	Multifidelity Uncertainty Quantification of a Notional Munition in a Fire Scenario Using Reduced Order Models	K20-01: Novel Numerical Methods for Heat Transfer Applications	Tuesday, July 8, 2025
Bhatia	Bikram	169822	High Performance Solid-State Heat Engine With Radiative Thermal Switching	K6-08: Heat Transfer In Energy System - Alternative Power Generation II	Thursday, July 10, 2025
Bhatia	Bikram	170052	Design and Experimental Evaluation of a Barocaloric Heat Pump	K6-02: Heat Transfer In Energy System - Waste Heat II	Tuesday, July 8, 2025
Biswas	Saykat Kumar	155713	Large Eddy Simulation of Flow Over a Heated Sphere	K20-03: Computational Heat Transfer in Fluid Applications	Tuesday, July 8, 2025
Bocus	Kaleem	170028	Porous Activated Carbon Coatings Using Yeast-Engineering	K15-02: Transport Phenomena in Manufacturing and Energy Manufacturing I	Thursday, July 10, 2025
Borca-Tasciuc	Diana-Andra	169892	Molecular Dynamics Modeling of Water's Thermodynamics Properties Under Strong Electric Fields	ASME Symposium Celebrating Professor Vijay K. Dhir 2	Tuesday, July 8, 2025
Carey	Van	170023	Custom Loss Function Strategies for Enhancing Use of Pinns in Heat Transfer and Energy Conversion System Modeling	K8-01: Fundamentals of Machine Learning for Heat Transfer	Tuesday, July 8, 2025
Carey	Van	170038	Strategies for Use of Specialized Convolution Neural Networks to Enhance Exploration of Two-Phase Morphology Effects on Vaporization Heat Transfer	ASME Symposium Celebrating Professor Vijay K. Dhir 1	Tuesday, July 8, 2025
Castillo-Orozco	Eduardo	157210	Computational Design and Optimization of a Dual-Inlet Liquid-Cooled Heat Sink With Flat Jets for Electronics	K16-02: Heat Transfer In Electronic Equipment II	Tuesday, July 8, 2025
Chakraborty	Pranay	151407	Numerical Simulation of Nanofluid Flow for Optimized Cooling Performance	K20-06: Computational Heat Transfer in Fluid Applications	Thursday, July 10, 2025

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Champhekar	Omkar	169544	A Novel Reduced Order System Model With Varying Coolant Flow Rates for Battery Thermal Management	K20-01: Novel Numerical Methods for Heat Transfer Applications	Tuesday, July 8, 2025
Chang	Ren-Chun	156404	Effect of Sintered Powder Size on the Convective Boiling Performance in a Larger Diameter Vertical Pipe – An Experimental Investigation	K13-02: Flow Boiling II	Wednesday, July 9, 2025
Chaudhary	Maheswar	164999	Water-Resistant and Durable Superhydrophobic Surface Using Carbon Soot and Porous Silica Inverse Opal	K13-03: Flow Boiling III	Wednesday, July 9, 2025
Chaudhary	Maheswar	170009	A Deep-Learning Approach for Image Recognition of Flow Patterns in a Closed Loop Oscillating Heat Pipe	K8-04: Fundamentals of Phase Change including Micro/ Nanoscale Effects	Thursday, July 10, 2025
Chavan	Chinmay	156911	Experimental Study of the Performance of a Novel Swirl Flow Separator for High Salinity Desalination Applications	K10-02: Heat Transfer Equipment	Thursday, July 10, 2025
Chen	Gang	164286	Peculiarities of Evaporation and Condensation of Pure Substance and With Non-Condensable Gas	ASME Symposium Celebrating Professor Vijay K. Dhir 2	Tuesday, July 8, 2025
Chen	Leitao	157857	Finite Volume Discrete Boltzmann Method Simulations for Mixed Convection in a Lid Driven Square Cavity	K20-03: Computational Heat Transfer in Fluid Applications	Tuesday, July 8, 2025
Chen	Tailian	156376	Effects of Helical Ridges on Internal Flow Over a Large Range of Flow Conditions	K8-05: Fundamentals of Single Phase Convection or Multiphysics Transport	Thursday, July 10, 2025
Chen	Yikang	157682	Radiative Heat Transfer Enhanced by Hyperbolic Phonon Polaritons in MoO3	K9-04: Emerging Energy Carriers	Wednesday, July 9, 2025
Cheng	Qilong	158426	Nanoscale Thermal Transport Across Hamr Head-Disk Interface and Its Application Towards Lubricant Diagnosis	K9-08: Thermal Transport in Nanomaterials/across Interfaces 2	Thursday, July 10, 2025
Chettiar	Kaushik	158026	Performance Comparison of Microchannel Heat Exchangers With Different Surface Wettability in Reversible Air Source Heat Pumps Under Frosting Conditions	K10-03: Heat Transfer Equipment	Thursday, July 10, 2025
Chowdhury	Nusrat	168469	Low and High Thermal Conductivity in Linear, Network, and Liquid-Crystalline Polymers	K7-01: Optical Characterization of Thermophysical Properties	Tuesday, July 8, 2025

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Croce	Giulio	169926	Numerical Characterization of Droplet Distributions Over Hydrophobic Coatings for Anti-Icing Operations	K20-05: Micro and Nanoscale Computational Heat Transfer	Wednesday, July 9, 2025
Da Silva	Ramon P.P.	156650	Estimation of Heat Fluxes From the Internal and External Surfaces of a Band Heater	K6-03: Heat Transfer In Energy System - Components I	Tuesday, July 8, 2025
Dalal	Amaresh	157867	A Compact Hybrid Battery Thermal Management System With Phase Change Material Embedded Fin Structures for Cylindrical Lithium-Ion Batteries	K6-06: Heat Transfer In Energy System - Thermal and Electrochemical Energy Storage II	Wednesday, July 9, 2025
Day	Ryan	164016	Development of a Microfluidic Isothermal Titration Calorimeter	SHTC Poster Presentations	Tuesday, July 8, 2025
de Mendonça Luz	Guilherme	152440	Dual-Fidelity Numerical Modeling Approach for Screen-Wick Heat Pipe Operability Assessment and Design Integration	K10-01: Heat Transfer Equipment	Tuesday, July 8, 2025
Deshpande	Prathamesh	168572	Effect of AC Electric Fields on Bubble Dynamics and Liquid-Vapor Interface	SHTC Poster Presentations	Tuesday, July 8, 2025
Dolui	Santu	156493	The Relative Importance of Fuel Properties on Spray-Wall Interaction in Gasoline Direct Injection System: A Numerical Analysis Under ECN Spray G Conditions	K6-03: Heat Transfer In Energy System - Components I	Tuesday, July 8, 2025
Eissa	Mohamed	155629	Condensation Heat Transfer and Pressure Drop of Low GWP Refrigerants Within a Horizontal Smooth Tube for High Temperature Heat Pump Applications	K13-07: Enhanced Condensation Heat Transfer	Thursday, July 10, 2025
Eissa	Mohamed	157803	A Generalized Non-Equilibrium Film Theory Heat Transfer Model for Annular Flow Condensation of Binary Zeotropic Mixtures	K13-07: Enhanced Condensation Heat Transfer	Thursday, July 10, 2025
Fagbemi	Samuel	163526	Programmable Flash Joule Heating in Carbon-Graphite Structures for Alkane Dehydrogenation	K20-05: Micro and Nanoscale Computational Heat Transfer	Wednesday, July 9, 2025
Faghihi	Parsa	158416	Fabrication of Microstructures for Enhanced Single-Droplet Jumping Condensation	K8-03: Fundamentals of Phase Change including Micro/ Nanoscale Effects	Wednesday, July 9, 2025
Faghri	Amir	169433	Scholarly Trends and Rankings in Heat Transfer	ASME Symposium Celebrating Professor Vijay K. Dhir 3	Tuesday, July 8, 2025

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Farouk	Bakhtier	156174	Pyrolysis - Gasification and Heat Release Rate Predictions of Heated Solid Specimens in the OSU Apparatus	K12-02: Aerosapce Heat Transfer-II	Tuesday, July 8, 2025
Francoeur	Mathieu	166538	Near-Field Radiative Heat Transfer Between Subwavelength Dielectric Membranes	K9-07: Near-Field Thermal Radiation	Thursday, July 10, 2025
Fuhrmann	Samuel	155976	Coupled Thermo-Fluid Dynamics and Structural Mechanics Conceptual Design of Heat Exchangers in Aero Engines	K12-01: Aerosapce Heat Transfer-I	Tuesday, July 8, 2025
Ghanekar	Alok	166107	Reversible Symmetry-Breaking for Dynamic Control of Thermal Radiation	K9-02: Radiative Cooling and Radiative Properties of Nanomaterials	Tuesday, July 8, 2025
Ghorbani	Mahdi	159942	Immersion Cooling for High-Power Wireless EV Chargers	K16-02: Heat Transfer In Electronic Equipment II	Tuesday, July 8, 2025
Ghosh	Durga Prasad	155354	Performance Evaluation of a 3D-Printed Multi-Layer Wick Flow Condenser	K16-01: Heat Transfer In Electronic Equipment I	Tuesday, July 8, 2025
Ghosh	Durga Prasad	156611	Experimental Investigation of 3D Printed Polymeric Trifurcated Evaporators	K13-04: Liquid-to-Vapor Phase-Change at Enhanced Surfaces I	Wednesday, July 9, 2025
Ghosh	Neil	157638	An Optically-Gated Electrostatic Field-Effect Thermal Switch	K9-09: Tunable Thermal Transport	Thursday, July 10, 2025
Giri	Ashutosh	157610	Origin of Ultralow Thermal Conductivity in Metal Halide Perovskites	K9-08: Thermal Transport in Nanomaterials/across Interfaces 2	Thursday, July 10, 2025
Goeson	Tanner	171816	Building Thermal Controls for Automotive Electric Propulsion: An Overview	K6-01: Heat Transfer In Energy System - Waste Heat I	Tuesday, July 8, 2025
Goyal	Aashish	163740	A Block-Structured Adaptive Mesh Framework to Solve Radiation Transfer Equation in Irregular Embedded Geometries	K20-08: Computational Heat Transfer: Applications	Thursday, July 10, 2025
Greff	Andrew	169565	Modeling Refrigeration Systems With Simscape and Matlab: First Principles and Custom Fluids	K20-08: Computational Heat Transfer: Applications	Thursday, July 10, 2025
Gubisch	Sumner	155796	Additively Manufactured Multifunctional Heat Exchanger With Integrated Thermoelectric Generator	K6-03: Heat Transfer In Energy System - Components I	Tuesday, July 8, 2025
Guesmi	Montadhar	164494	Water-Oxygen Two-Phase Flow in the Plate and Frame Heat Exchanger: Flow Behaviour and Thermal Performance Study	K10-03: Heat Transfer Equipment	Thursday, July 10, 2025

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Habibi	Mohammad	165719	Enhancing Radiative Heat Transfer for Thermophotovoltaics and Hot Carrier Nanoscopy	K8-06: Fundamentals of Thermometry	Thursday, July 10, 2025
Heydari	Ali	172139	Implementation of Liquid Cooling for Hyperscale Ai Data Centers: Challenges and Opportunities	ASME Symposium Celebrating Professor Vijay K. Dhir 2	Tuesday, July 8, 2025
Hlifka	Brian	157646	Steady-State Heat Load Estimation Using Optical Fiber With Optical Frequency Domain Reflectometry	K15-01: Laser, Optical and Thermal Manufacturing	Tuesday, July 8, 2025
Hodges	Wyatt	167462	Thermoreflectance Measurements and Modeling of Near-Field Thermal Radiation and Air Nanogaps	K9-01: Nanothermal Metrology	Tuesday, July 8, 2025
Honary	Ryan	167293	An AI-Enabled Fluid Dynamics Based Approach for the Detection of a Wildfire in Its Incipient Stage	K8-01: Fundamentals of Machine Learning for Heat Transfer	Tuesday, July 8, 2025
Hu	Yongjie	169864	Control Heat Transfer for Semiconductor Thermal Management, Quantum Devices, and Biotechnology	K9-06: Thermal Transport in Nanomaterials 1	Thursday, July 10, 2025
Hu	Yongjie	171587	Revolutionizing Thermal Management With Extreme Materials and Active Phonon Devices	ASME Symposium Celebrating Professor Vijay K. Dhir 5	Wednesday, July 9, 2025
Huang	Xiaona	165548	Divergent Interfacial Thermal Transport in MoS2/Si Heterostructure Over Optical Phonon Modes	K7-02: Applications of Thermophysical Characterization	Tuesday, July 8, 2025
Huang	Xiaona	165550	Observation of Enhanced Heat Transfer Between a Nanotip and Substrate at Nanoscale Distances via Direct Temperature Probing With Raman Spectroscopy	K7-01: Optical Characterization of Thermophysical Properties	Tuesday, July 8, 2025
Huang	Yanbo	168404	Topology Optimization of Heat Sinks Under Pool Boiling Conditions for Two-Phase Immersion Cooling of High-Power Electronics	K16-03: Heat Transfer In Electronic Equipment III	Wednesday, July 9, 2025
Hui	Jiuwu	151509	Mathematical Modeling and Optimized Fractional-Order PID Control for Water-Cooled Chillers Using Particle Swarm Optimization Algorithm	K10-01: Heat Transfer Equipment	Tuesday, July 8, 2025
Hussein	Mahmoud	168410	Thermodynamics of Resonant Phonons: Slowdown of Entropy Production by Coherent Waves	K9-04: Emerging Energy Carriers	Wednesday, July 9, 2025
Ignuta-Ciuncanu	Matei C.	154840	Generative Constructal Design of a Multi-Physics Heat Sink for Managing Transient Thermal Loads	K8-01: Fundamentals of Machine Learning for Heat Transfer	Tuesday, July 8, 2025
Ignuta-Ciuncanu	Matei-Cristian	167699	Generative Constructal Design of Thermal Flow Systems	SHTC Poster Presentations	Tuesday, July 8, 2025

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Jorgensen	Ashley	155403	Optimizing Electrical Stimulation Parameters for Safe and Effective Cartilage Regeneration: A Computational Study on Thermal Dissipation in Articular Tissues	K20-02: Computational Bio Heat Transfer	Tuesday, July 8, 2025
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Jukanti	Vikas	169849	Nonlinear Dynamics of Boiling: Investigating Bubble Interactions and Cycle Time Statistics	ASME Symposium Celebrating Professor Vijay K. Dhir 6	Wednesday, July 9, 2025
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Kim	Tae Kyu	169917	Rapid Thermal Cycling for Thermochemical Energy Storage Cyclical Performance Characterization	K6-10: Thermal Energy Storage Symposium II	Thursday, July 10, 2025
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Vahab	Mehdi	164850	Thermal Reduced-Order Model and System-Level Simulation of Battery Spatial Temperature Variation During Fast Charge	K6-06: Heat Transfer In Energy System - Thermal and Electrochemical Energy Storage II	Wednesday, July 9, 2025
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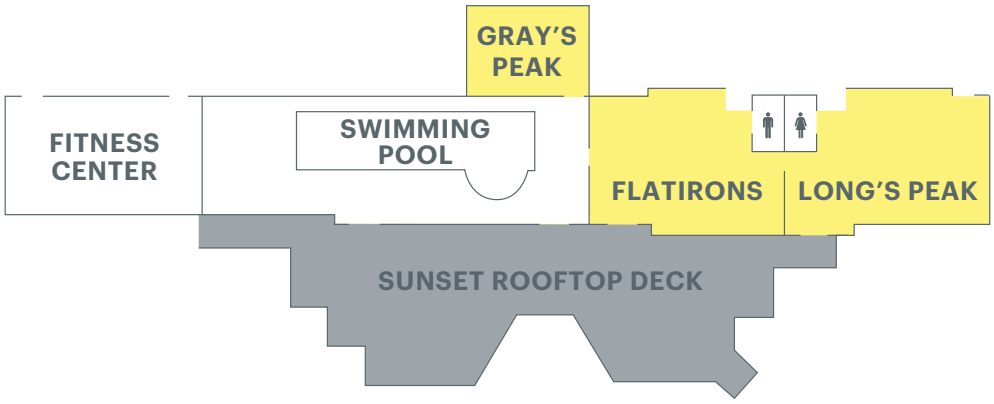

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Dr. Sandra Boetcher,
Conference Chair,
Embry-Riddle Aeronautical University

Dr. Sandra Boetcher is a Professor of Mechanical Engineering and College of Engineering Research Fellow at Embry-Riddle Aeronautical University. She obtained her B.M.E., M.S., and Ph.D. in Mechanical Engineering from the University of Minnesota in 2001, 2003, and 2006, respectively. Prior to her appointment at Embry-Riddle, Professor Boetcher was a founding faculty member in the newly formed Department of Mechanical and Energy Engineering at the University of North Texas and worked for several companies, including Honeywell, 3M, and Donaldson Company. Her recent research interests include realizing latent heat thermal energy storage systems utilizing advanced manufacturing, investigating the fundamental behavior of phase-change materials through numerical simulations and experiments, and characterizing the heat transfer performance of supercritical fluids. She is the recipient of the 2025 ASHRAE E.K. Campbell Award. She is currently an editor of Carbon Capture Science and Technology, associate editor of International Journal of Heat and Fluid Flow, and associate editor for the ASME Journal of Heat and Mass Transfer. She has served as a Past-Chair of the ASME Heat Transfer Division Executive Committee and is a Fellow of ASME.

Dr. Rydge Mulford,
Technical Program Chair,
University of Dayton

Dr. Rydge Mulford is an associate 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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