ASME ES 2025

19th International Conference on Energy Sustainability

Program

CONFERENCE
July 8–10, 2025

The Westin Westminster
Westminster, Colorado, USA

https://event.asme.org/ES

The American Society of Mechanical Engineers®
ASME®

ASME®
SETTING THE STANDARD

Contents

WELCOME

FROM THE ES 2025 CONFERENCE ORGANIZING COMMITTEE

Dear Colleagues,

On behalf of ASME's Advanced Energy System Division (AESD) and Solar Energy Division (SED), we are delighted to welcome you to the 19th International Conference on Energy Sustainability (ES 2025) Conference in Westminster Colorado from July 8 to 10, 2025!

The conference is a leading forum in which experts and researchers from academia, industry, national labs, and other key organizations gather to exchange ideas, research achievements, and explore technical developments related to energy and sustainability. The conference technical tracks cover a wide range of topics including Sustainable Buildings and Communities, Concentrating Solar Power, Solar Chemistry, Wind Energy, Energy Storage, Sustainable Manufacturing, Industrial Process Heat, Alternative Fuels, Geothermal Energy, Hydrogen Energy, Carbon Capture, Education and Policy for Clean Energy Transition, and more. The ES 2025 Conference is co-located with the Summer Heat Transfer Conference (SHTC 2025) to provide an opportunity for the attendees to expand their networks and participate in technical sessions on broader, but related, topics. We are pleased to announce that we have a full three-day schedule, including expert technical presentations, keynote speakers, panelists, and networking events.

ES 2025 will feature three distinguished keynote speakers: Dr. Ying Sun, Herman Schneider Professor at the University of Cincinnati; Dr. Junhong Chen, Crown Family Professor of Molecular Engineering at the University of Chicago; and Dr. Jason Woods, Senior Research Engineer at National Renewable Energy Laboratory (NREL). In addition, we are excited to announce panel sessions featuring experts from multiple sectors, including industry: (1) Energy Policy and Industry Perspectives, (2) AI/ML Applications for High Performance and Resilient Buildings and Cities, and (3) Long Duration Energy Storage Technologies; a workshop on "Modeling Methods for High-Temperature Particle Flows in Energy Storage, Chemical Reactors, and Additive Manufacturing"; and a special technical symposium honoring Professor Jane Davidson from the University of Minnesota.

Additionally, ES 2025 is pleased to host a half-day tour of the NREL's Golden Labs, offering participants a unique opportunity to gain firsthand insight into NREL's state-of-the-art facilities with special focus on their Energy Systems Integration Facility and the High-Flux Solar Furnace. We continue to offer and organize special programming outside of technical tracks with an emphasis on student and early career researcher participation, engagement and networking, including a Student Career Panel, Lighning Talks and newly piloted Power Hour.

This year's conference organizers have continued to prioritize the participation of new voices in our conference through registration discount awards funded by AESD and SED. These awards provide partial registration discounts for student participants as well as research scholars with substantial financial need to attend and present at our conference. It recognizes the critical role that the next generation of scholars play in ushering along the energy transition and in the future of the conference.

The ES Conference Organizing Committee would like to express our deep gratitude to the many volunteers that have made the conference possible. We wholeheartedly thank the track chairs and co-chairs, the session chairs and co-chairs, and all reviewers who have generously given their time to assemble a high-quality technical program. We also sincerely appreciate NREL for supporting the tour. We would also like to thank ASME staff members for their dedicated support of the program, and we especially express our gratitude to our authors and presenters for sharing their research results. We sincerely hope you enjoy the conference!

2025 ENERGY SUSTAINABILITY CONFERENCE ORGANIZING COMMITTEE

GENERAL CONFERENCE CHAIRS

Rohini Bala Chandran, Ph.D.
Associate Professor of Mechanical Engineering
University of Michigan

Pei Dong, Ph.D.
Associate Professor of Mechanical Engineering
George Mason University

TECHNICAL PROGRAM CHAIRS

Like Li, Ph.D.
Associate Professor of Mechanical Engineering
University of Central Florida

Hailei Wang, Ph.D.
Associate Professor of Mechanical and Aerospace Engineering
Utah State University

TECHNICAL PROGRAM CO-CHAIRS

Shuang Cui, Ph.D.
Assistant Professor of Mechanical Engineering
University of Texas at Dallas

Aggrey Mwesigye, Ph.D.
Assistant Professor of Mechanical and
Manufacturing Engineering
University of Calgary

Andrew J. Schrader, Ph.D.
Assistant Professor of Mechanical and Aerospace Engineering
University of Dayton

Sarvenaz Sobhansarbandi, Ph.D.
Assistant Professor of Mechanical Engineering
California State University, Sacramento

REGISTRATION INFORMATION

Westminster Ballroom 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

SPONSOR EXHIBIT HOURS

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.

BADGE REQUIRED FOR ADMISSION

All conference attendees must wear an official ASME 2025 ES badge at all times in order to gain admission to technical sessions, exhibits, keynotes, meals, and other conference events. Without a badge, you will not be granted admission to conference activities. Pickup your ES badge at the ASME registration table in the Westminster Ballroom Foyer on the First Floor.

ASME CONFERENCES APP

ES/SHTC will utilize the mobile app "ASME Conferences" in place of a printed program to enhance the conference experience for attendees, speakers, exhibitors, and sponsors.

The ASME Conferences app will allow you to:

- Have the most up-to-date conference schedule in the palm of your hand
- Connect with fellow attendees
- Receive important conference updates and reminders
- Search and access session information
- Download final papers
- View speaker profiles

Keep an eye on your email for more information on how to access and navigate the app!

If you have any questions, please see ASME staff at the registration desk in Westminster Ballroom Foyer.

INTERNET ACCESS

Complimentary basic Internet is provided in the sleeping rooms if you are staying at the Westin Westminster. It is also available in the hotel's public space and in the meeting space.

Network: MarriottBonvoy_Conference
Password: 24westin24

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.

SESSION ROOM EQUIPMENT

All technical sessions will be equipped with one LCD projector and one screen. Laptops will NOT be provided in the sessions. Presenters must bring their own or make arrangements in advance with the session chairs to use theirs. It is recommended that presenters bring all visual aids with them (slide advancer, pointer, etc.).

Conference Information

SPEAKER READY ROOM

The Westin Boardroom located on the 12th Floor 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

OPENING RECEPTION

Join your peers for refreshments, light food, and casual networking.

Monday, July 7, 6:00PM–7:00PM
South Courtyard outside on the First Floor

SOLAR ENERGY DIVISION (SED) AND ADVANCED ENERGY SYSTEMS DIVISION (AESD) AWARDS LUNCHEON

The Awards Luncheon will be on Wednesday, July 9 from 12:00PM to 1:30PM in Westminster Ballroom III on the First Floor. Come celebrate a select group for their contributions and achievements in energy sustainability.

Open to all ES registrants! Guest tickets are available on a limited basis for purchase in advance. Please see the ASME registration table for details.

CONFERENCE LUNCHES/POSTER PRESENTATIONS

On Tuesday and Thursday, Conference lunches 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. On Tuesday, authors will present their research posters during lunch. Grab a boxed lunch and use the lunch time to view the posters and support the authors.

CONFERENCE REFRESHMENT BREAKS

Morning and afternoon breaks will be provided in the Westminster Ballroom Foyer on the First Floor. Come and meet our sponsors 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

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. 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.

EMERGENCY INFORMATION

If you are experiencing a health emergency, please dial 911 and 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 Predetermined 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 REENTER 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.

MEMBERSHIP TO ASME (4 MONTHS FREE)

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

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

MOTHERS' ROOM

Westminster Office, First Floor, Outside the Westminster Ballroom
Tuesday–Thursday
7:00AM–5:00PM

This private room is available on a first-come, first-served basis as a dedicated space where lactating individuals are welcome to pump or nurse. A sign-up sheet will be provided on the door to schedule individual times.

A small refrigerator, chair, water station, and electrical outlet will be available.

REGISTRANTS WITH DISABILITIES

Whenever possible, we are pleased to plan for registrants with disabilities. Advance notice may be required for certain requests. For on-site assistance, please visit the conference registration area and ask to speak with a conference representative.

PHOTOGRAPHS/VIDEO/AUDIO RECORDINGS

Participants are reminded that material presented at ASME conferences is under copyright of ASME. As a result, any recording of the presentations is prohibited.

LIMITATION OF LIABILITY

You agree to release and hold harmless ASME from all claims, demands, and causes of action arising out of or relating to your participation in this event.

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: 10:00am–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

Schedule at-a-Glance

The schedule is subject to change. Please refer to the ASME Conferences app for detailed technical session schedule.

MOUNTAIN TIME	MONDAY, JULY 7TH	LOCATION
10:00AM–6:00PM	Registration	Westminster Foyer
10:00AM–3:00PM	NREL Tour	Meet in Lobby
3:00PM–5:30PM	Workshop: Modeling Methods for High-Temperature Particle Flows in Energy Storage, Chemical Reactors, and Additive Manufacturing (Separate Registration Fee Required)	Standley Ballroom I
6:00PM–7:00PM	Opening Reception	South Courtyard
MOUNTAIN TIME	**TUESDAY, JULY 8TH**	**LOCATION**
7:00AM–5:00PM	Registration	Westminster Foyer
7:00AM–5:00PM	Mother's Room	Library
8:00AM–5:00PM	Speaker Ready Room	Westminster Office I
8:00AM–9:00AM	ES Panel: Energy Policy and Industry Perspectives	Westminster Ballroom IV
9:00AM–10:00AM	ES Keynote: Data-Driven Innovation in Multiphase Transport for Sustainable Energy Systems, Dr. Ying Sun	Westminster Ballroom IV
10:00AM–10:20AM	Networking Break	Westminster Foyer
10:00AM–10:20AM	Joint ES/SHTC Newcomer Social	Westminster Ballroom III
10:20AM–12:00PM	01-01: Decarbonizing Industrial Processes	Meadowbrook Ballroom I
10:20AM–12:00PM	02-01: AI for Energy Sustainability I	Flatirons
10:20AM–12:00PM	03-01: Advances in Indoor Environment Technologies and Solutions	Windsor
10:20AM–12:00PM	06-01: CSP Optical Systems	Standley Ballroom I
10:20AM–12:00PM	07-01: Experimental Characterization of Particle Flows	Meadowbrook Ballroom II
10:20AM–12:00PM	19-01: Symposium to Honor Professor Jane Davidson I	Westminster Ballroom II
12:00PM–1:30PM	Lunch and Poster Session	Legacy Ballroom & Foyer
1:30PM–3:10PM	04-01: Energy Storage Systems and Applications	Meadowbrook Ballroom I
1:30PM–3:10PM	13-01: Hydrogen and Fuel Cells	Windsor
1:30PM–3:10PM	18-01: Advanced Materials for Sustainability	Flatirons
1:30PM–3:10PM	09-01: Solar Chemistry I	Meadowbrook II
1:30PM–3:10PM	10-01: Photovoltaic, Photovoltaic-Thermal, and Electrochemical Technologies I	Westminster Ballroom II
1:30PM–3:10PM	08-01: Deployment and Analysis of CSP Subsystems	Standley Ballroom I
3:10PM–3:30PM	Networking Break	Westminster Foyer
3:30PM–5:10PM	19-02: Symposium to Honor Professor Jane Davidson II	Westminster Ballroom II
3:30PM–5:10PM	14-01: Carbon Capture & Cleaner Fossil Fuel Technologies I	Flatirons
3:30PM–5:10PM	03-02: Innovative Building Material and Technologies	Windsor
3:30PM–5:10PM	06-02: CSP Receivers and Reactors I	Standley Ballroom I
3:30PM–5:10PM	07-02: Fluidized Bed Heat Exchangers	Meadowbrook Ballroom II
3:30PM–5:10PM	08-02: Technoeconomic Analysis of CSP and Thermal Energy Storage Systems	Meadowbrook Ballroom I
5:15PM–6:15PM	Lightning Talks	Windsor

Schedule at-a-Glance

The schedule is subject to change. Please refer to the ASME Conferences app for detailed technical session schedule.

Mountain Time	WEDNESDAY, JULY 9TH	LOCATION
7:00AM–5:00PM	Registration	Westminster Foyer
7:00AM–5:00PM	Mother's Room	Library
8:00AM–5:00PM	Speaker Ready Room	Westminster Office I
8:00AM–9:00AM	Panel: AI/ML Applications for High Performance and Resilient Buildings and Cities	Westminster Ballroom IV
9:00AM–10:00AM	Keynote: The Circular Water Economy: Addressing the Global Water-Energy Nexus Challenge, Junghon Chen, Ph.D.	Westminster Ballroom IV
10:00AM–10:20AM	Networking Break	Westminster Foyer
10:20AM–12:00PM	01-02: Decarbonizing Commodity Chemicals and Emissions Analyses	Windsor
10:20AM–12:00PM	02-02: AI for Energy Sustainability II	Meadowbrook Ballroom II
10:20AM–12:00PM	03-03: Building Performance Simulations for Sustainable Solutions	Standley Ballroom I
10:20AM–12:00PM	09-02: Solar Chemistry II	Meadowbrook Ballroom I
10:20AM–12:00PM	10-02: Photovoltaic, Photovoltaic-Thermal, and Electrochemical Technologies II	Flatirons
10:20AM–12:00PM	19-03: Symposium to Honor Professor Jane Davidson III	Westminster Ballroom II
12:00PM–1:30PM	Solar Energy Division (SED) and Advanced Energy Systems Division (AESD) Awards Luncheon	Westminster Ballroom III
1:30PM–3:10PM	04-02: Particles and Materials for Energy Storage	Meadowbrook Ballroom I
1:30PM–3:10PM	13-02: Hydrogen Production and Storage	Flatirons
1:30PM–3:10PM	03-04: Innovative Strategies and Energy Storage for Resilient Communities	Standley Ballroom I
1:30PM–3:10PM	06-03: CSP Receivers and Reactors II	Meadowbrook Ballroom II
1:30PM–3:10PM	07-03: Thermal Energy Storage: Phase-Change and Thermochemical	Windsor
1:30PM–3:10PM	09-03: Solar Chemistry III	Westminster Ballroom II
3:10PM–3:30PM	Networking Break	Westminster Foyer
3:30PM–5:10PM	19-04: Symposium to Honor Professor Jane Davidson IV	Westminster Ballroom II
3:30PM–5:10PM	14-02: Carbon Capture & Cleaner Fossil Fuel Technologies II	Windsor
3:30PM–5:10PM	03-05: Advances in Renewable Energy and Integration	Standley Ballroom I
3:30PM–5:10PM	11-01: Alternative Energy Converstion Technology (including Wind, Geothermal, Hydro, and Ocean)	Flatirons
3:30PM–5:10PM	06-04: CSP Receivers and Reactors III	Meadowbrook Ballroom II
3:30PM–5:10PM	07-04: Modeling of Thermal Energy Storage and Receiver Systems	Meadowbrook I
5:20PM–6:20PM	SHTC/ES Career Panel	Gray's Peak
5:20PM–6:20PM	SED Buildings Committee Meeting	Westminster Ballroom II
5:20PM–6:20PM	SED Concentrated Solar Committee Meeting	Standley Ballroom I
5:20PM–6:20PM	SED Solar Chemistry Technical Committee Meeting	Meadowbrook I
5:20PM–6:20PM	AESD REEC Committee Meeting	Flatirons

Schedule at-a-Glance

The schedule is subject to change. Please refer to the ASME Conferences app for detailed technical session schedule.

6:25PM–8:30PM	SED Executive Committee Meeting (Closed Meeting)	Windsor
Mountain Time	**THURSDAY, JULY 10TH**	**LOCATION**
07:00AM–5:00PM	Registration	Westminster Foyer
07:00AM–5:00PM	Mother's Room	Library
08:00AM–5:00PM	Speaker Ready Room	Westminster Office I
08:00AM–9:00AM	Keynote: Air Conditioning in Buildings: Challenges and New Approaches, Dr. Jason Woods	Westminster Ballroom IV
09:00AM–10:00AM	ES Panel: Long Duration Energy Storage (LDES) Technologies	Westminster Ballroom IV
10:00AM–10:20AM	Networking Break	Westminster Foyer
10:20AM–12:00PM	19-05: Symposium to Honor Professor Jane Davidson V	Westminster Ballroom II
10:20AM–12:00PM	04-03: Thermomechanical Energy Storage	Meadowbrook Ballroom II
10:20AM–12:00PM	03-06: Heat Pump Technologies for Sustainable Solutions	Windsor
10:20AM–12:00PM	13-03: Alternative Fuel Production and Utilization I	Flatirons
10:20AM–12:00PM	12-01: Process Heat for Desalination	Standley Ballroom I
10:20AM–12:00PM	06-05: CSP Receivers and Reactors IV	Meadowbrook I
12:00PM–1:30PM	SHTC & ES Lunch	Legacy Ballroom
1:30PM–3:10PM	09-04: Solar Chemistry IV	Windsor
1:30PM–3:10PM	13-04: Alternative Fuel Production and Utilization II	Flatirons
1:30PM–3:10PM	12-02: Process Heat for Industrial Decarbonization	Meadowbrook Ballroom I
2:30PM–4:30PM	AESD Executive Committee Meeting (Closed Meeting)	Standley Ballroom I
3:10PM–3:30PM	Networking Break	Westminster Foyer
3:30PM–5:10PM	Power Hour	Westminster Ballroom II
5:10PM	CONFERENCE ENDS	

Committee Meetings

TIME	EVENT	ROOM
WEDNESDAY, JULY 9		
5:20PM–6:20PM	SED: Buildings Technical Committee Committee Chair: Jian Zhang	Westminster Ballroom II
5:20PM–6:20PM	SED: Concentrated Solar Power Technical Committee Committee Chair: Jeremy Sment	Standley Ballroom I
5:20PM–6:20PM	SED: Solar Chemistry Technical Committee Committee Chair: Johannes Grobbel	Meadowbrook I
5:20PM–6:20PM	AED REEC Committee Committee Chair: Aggrey Mwesigye	Flatirons
6:25PM-8:30PM	Solar Energy Division Executive Committee Meeting (Closed Meeting)	Windsor
THURSDAY, JULY 10		
2:30PM–4:30PM	Advanced Energy Systems Division Executive Committee Meeting (Closed Meeting)	Standley Ballroom I

WORKSHOP

MONDAY, JULY 7 **3:00PM–5:30PM**
STANDLEY BALLROOM I

Fee $35

Modeling Methods for High-Temperature Particle Flows in Energy Storage, Chemical Reactors, and Additive Manufacturing

This workshop will focus on a series of short tutorials/presentations that discuss modeling flow physics and heat transfer (conduction, convection, radiation) in particle flow systems.

Workshop Agenda:

Session 1: Available Particle Modeling Methods and Comparisons Between Multiphase Continuum Methods, etc.

This session introduces and compares three foundational particle modeling approaches used to simulate particulate systems in engineering and scientific applications: Discrete Element Methods (DEM), Eulerian–Lagrangian models, and Eulerian–Eulerian multiphase models incorporating μ(I) rheology. The session is designed to equip future researchers with a broad understanding of each method's governing assumptions, computational requirements, and practical use cases. Emphasis will be placed on selecting the appropriate modeling approach based on the physical behavior of interest, available computational resources, and desired level of resolution. Participants will be provided with curated resources, example codes, and pathways to begin implementing each method in their own research.

Dr. Andrew J. Schrader *(Presenter)* is an Assistant Professor of Mechanical and Aerospace Engineering at the University of Dayton, where he leads the Dayton Thermal Applications (DaTA) Laboratory. He earned his B.S. in Mechanical Engineering from Valparaiso University (2014), and M.S. (2017) and Ph.D. (2019) degrees from the Georgia Institute of Technology, where he studied high-temperature granular flows and solar thermochemical systems under Dr. Peter Loutzenhiser. Following his doctoral work, he served as a postdoctoral fellow at Georgia Tech, advancing modeling tools for granular media. At the University of Dayton, Dr. Schrader's research focuses on particle-based thermal energy storage and its integration with supercritical CO2 power cycles. He also founded the University of Dayton Supercritical CO_2 Interdisciplinary Research Center, fostering collaboration among academia, government, and industry to advance next-generation energy technologies in Southwest Ohio.

Session 2: Challenges and Lessons of Large-Scale Particle Modeling at Sandia National Laboratories

With the ongoing interest in particles for energy storage and concentrating solar power technologies, Sandia has been continuing to develop computational capabilities for discrete particle modeling by leveraging many existing projects and hardware. Recently, researchers at Sandia National Laboratories have coupled its in-house computational code suite, Sierra, with the open-source molecular dynamics code called the Large-scale Atomic/Molecular Massively Parallel Simulator (LAMMPS) to create a CFD-DEM capability that is able to utilize Sandia's high-performance computing (HPC) resources. While the immense computational resources provided by HPCs extends the scale of particle problems that can be analyzed, challenges remain to increase the computational domain beyond submodels of specific particle-based applications. This talk will showcase the current CFD-DEM computational capability at SNL through exemplars while discussing many of the ongoing efforts to improve the coupling and computational efficiency for this application space.

Dr. Brantley Mills *(Presenter)* is a principal member of the technical staff at Sandia National Laboratories specializing in the computational thermal/fluid sciences. Dr. Mills has worked in a broad range of heat transfer and renewable energy topics including: concentrating solar power, thermal systems analysis, thermal-fluid cryogenics, reduced-order modeling, and nuclear energy. While also having an experimental background, some of Dr. Mills' recent work has focused on the computational sciences with high-performance computing and the development of coupled, multi-physics models for particle-based concentrating solar power. Brantley Mills received his Ph.D. in nuclear engineering from the Georgia Institute of Technology in 2014 and his B.S. in mechanical engineering from Clemson University in 2009.

Session 3: Recent Advancements in DEM Modeling

Dr. Christoph Goniva *(Presenter)* received his Ph.D. in Computational Fluid Dynamics in 2011, at the Johannes Kepler University (JKU) in Linz, Austria. From 2011 to 2014, he has been Senior Research Associate at the Department of Particulate Flow Modelling at JKU, where he headed a DEM and CFD-DEM modelling team together with Dr. Christoph Kloss. Dr. Christoph Goniva is co-founder and director of DCS Computing, the producer of the DEM software Aspherix® and the CFD-DEM software CFDEM®coupling.

Session 4: GPU-Accelerated DEM Modeling

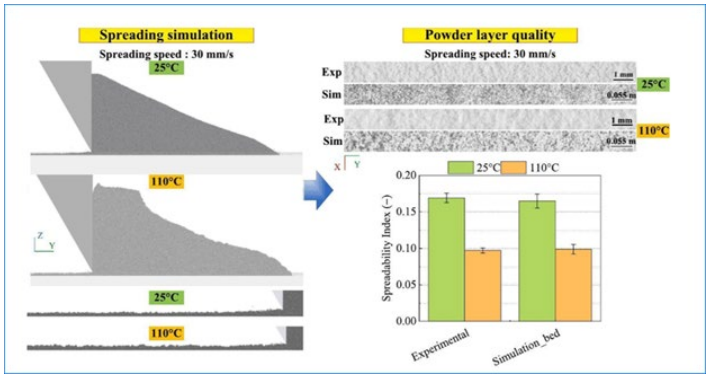
The Discrete Element Method (DEM) enables high-fidelity modeling of particle systems by resolving translational/rotational motion and contact forces between individual particles. However, scaling DEM to industrial applications—particularly when coupled with Computational Fluid Dynamics (CFD)—demands significant computational resources. This workshop presents a GPU-accelerated DEM solver designed to overcome these challenges through cost-effective parallelism and seamless integration with ANSYS Fluent. GPUs are uniquely suited for DEM due to their ability to execute thousands of simple, repetitive particle-force calculations in parallel. Unlike CPU clusters, which incur high costs for underutilized core capabilities, low-cost GPUs deliver superior performance for DEM's arithmetic-heavy workload. The solver leverages

this architecture to simulate millions of particles efficiently, avoiding the financial overhead of CPU-based systems. The solver imports ANSYS Fluent's CFD mesh directly via Dynamic-Linked Libraries (DLLs), eliminating cross-platform communication delays. Fluent's cell geometry—including tetrahedral, hexahedral, and polyhedral meshes—is used for particle-fluid/wall interactions, ensuring compatibility with complex industrial geometries. A streamlined particle-cell search algorithm removes the need for auxiliary grids, reducing memory usage while maintaining accuracy. A novel void fraction method further enhances robustness across unstructured or irregular meshes, critical for realistic fluid-particle systems. To maximize computational resources, the CFD (Fluent) and DEM solvers run concurrently: Fluent operates on the CPU for fluid dynamics, while the GPU handles all particle calculations. This concurrent execution avoids hardware idle time, enabling full utilization of available processing power. Performance benchmarks demonstrate significant speed improvements over both CPU-based and existing GPU-coupled DEM approaches, particularly for large-scale systems. By combining GPU parallelism, direct ANSYS Fluent integration, and optimized mesh handling, this solver provides a scalable, cost-effective solution for multiphase simulations—enabling high-resolution modeling of particle-laden flows without reliance on expensive infrastructure.

Dr. Alireza Kianimoqadam *(Presenter)* is a Postdoctoral Research Fellow at the University of Dayton working on particulate solar thermal energy systems. With a Ph.D. in Mechanical Engineering from the University of Maine and a foundational background from Isfahan University of Technology, he architects advanced simulation frameworks that bridge high-performance computing, machine learning, and multiphysics modeling.

Session 5: DEM Modeling Applied to Laser Powder Bed Fusion

In Powder Bed Fusion (PBF) additive manufacturing, the quality of the powder layer is vital for achieving high-density, defect-free parts. A smooth and uniformly packed layer ensures consistent energy absorption and proper layer bonding during the fusion process. Powder spreading is a key step that influences the homogeneity and stability of the deposited layer. Spreading speed significantly affects particle dynamics—higher speeds can increase particle inertia and reduce the time for rearrangement, resulting in unfilled regions and irregular surfaces. Temperature also plays an important role: at room temperature, lower interparticle cohesion promotes better flow and uniform deposition, whereas elevated temperatures enhance cohesion, leading to particle aggregation and reduced spreadability. These changes impact surface roughness and packing fraction, ultimately affecting the quality of the manufactured component. Numerical methods such as the Discrete Element Method (DEM) offer valuable insight by capturing particle-scale interactions and predicting powder behavior under various process conditions. By understanding the effects of spreading speed and temperature, more stable and optimized powder layering can be achieved, improving the overall efficiency and reliability of the PBF process.



Dr. Sina Zinatlou Ajabshir *(Presenter)* is currently a Postdoctoral Fellow in the Department of Industrial Engineering at the University of Salerno (UNISA), Italy. His research focuses on the properties of powders used in powder-based 3D printing methods. He holds a BSc and MSc in Materials Science and Engineering from the University of Tabriz and Sharif University of Technology (SUT), respectively. He earned his Ph.D. in Industrial Engineering with a specialization in Chemical Engineering from UNISA, with a dissertation centered on powder flowability and spreadability in powder bed fusion processes. Before joining the Powder Technology Group at UNISA, he served as a Research Assistant at SUT, where he worked on additive manufacturing and welding. His research interests include particle characterization, powder flow behavior, physical metallurgy, microstructure evolution, and the development of computational models using Discrete/Finite Element Methods.

Session 6: Unsteady Multiphase Flows in Inertial Particle Separators for Helicopter Engine Filtration Applications

Gas turbine engines can be subject to damage from ingesting dust, ash, and debris. This can result in increased maintenance costs, downtime, and even engine failure. An inertial particle separator (IPS) is an inlet-mounted device that can remove sand, dust, and other harmful material from the engine flow path. This system can minimize particulate ingestion during helicopter landings in austere brown-out conditions, increasing engine life and aircraft survivability. Typically, IPS systems have lower engine power losses than alternative engine inlet filtration technologies. Due to the competing demands of high particle separation and low total pressure costs, IPS designs must make a number of tradeoffs that affect both particle trajectories and flow path characteristics. Operational IPS designs may experience unsteady separated flows that lead to particles being ingested into the engine core flow. These unsteady flows are challenging to characterize even with a combination of modelling and testing. This presentation will review the relevant fluid and particle physics, testing and modelling approaches, and the current state of the art of IPS designs.

Dr. Brian Connolly *(Presenter)* is a Senior Research Engineer at Southwest Research Institute. His work focuses on computational modelling of multiphase, combustion, and hypersonic fluid flows.

Session 7: Fluidized Bed Modeling Methods

Dr. Federico Munnichi *(Presenter)* is a Researcher in Computational Science at the National Renewable Energy Laboratory (NREL) developing numerical methods for multiphase flows applied to energy-related processes. His research is centered around flows with gas, liquid, and solid components in extreme conditions, such as high-speed separation systems, low gravity bioreactors, plastic pyrolysis, and fibrilization of sheared PTFE powders. He has a Ph.D. in Chemical Engineering from the Graz University of Technology and has conducted research at academic institutions such as Purdue University, the University of Nottingham, and the Colorado School of Mines, where he developed mathematical models and numerical methods for slurry flows in fractures, gas-particle heat transfer, subsurface flows, fluidized bed heat exchangers, and membrane filtration. During his career, Dr. Municchi has conducted research on multiphase flows at all scales, from flows with resolved particles or bubbles to large systems employing coarse-grained continuum models.

TUESDAY, JULY 8 **9:00AM–10:00AM**
WESTMINSTER BALLROOM IV

Ying Sun, Ph.D.
Herman Schneider Professor
Department of Mechanical and Materials Engineering
University of Cincinnati

Keynote Title: Data-Driven Innovation in Multiphase Transport for Sustainable Energy Systems

Abstract: Harnessing AI and data science offers a transformative pathway to accelerate discovery and innovation of energy systems. From advanced modeling of transport phenomena and materials discovery to digital twins and extended reality, these tools enable the rapid development of next-generation solutions for batteries, electronics cooling, data centers, nuclear energy, and quantum computing, where energy efficiency and security is critical. Integrating multiphysics modeling with surrogate models, physics-informed AI, and hybrid approaches dramatically reduces computational cost while preserving accuracy, enabling efficient design space exploration. AI-driven inverse design further expands opportunities for system-level optimization under complex real-world constraints. This talk presents examples of machine learning, spanning supervised, unsupervised, generative AI, physics-informed, and reinforcement learning to enhance the understanding and design of multiphase transport processes across energy-intensive systems that support emerging industries in AI, quantum information science, and nuclear energy. The presentation also highlights the importance of building domain-specific data infrastructure to unify experimental data, high-fidelity simulations, and data-driven models, paving the way for more robust and scalable energy solutions.

Biography: Dr. Ying Sun is the Herman Schneider Professor in Mechanical Engineering and the Director of Research and Strategic Initiatives in the College of Engineering and Applied Science at the University of Cincinnati. She served as Head of the Department of Mechanical & Materials Engineering at the University of Cincinnati and as Program Director of the Thermal Transport Processes Program at the National Science Foundation. Her research interests span multiphase flows and heat/mass transfer, complex fluids and interfacial phenomena, machine learning and data-driven methods, and multi-scale modeling. Dr. Sun is an elected Fellow of APS and ASME and a recipient of the NSF CAREER Award, AFOSR Summer Faculty Fellowship, CNRS Visiting Professorship, and Drexel College of Engineering Research Achievement Award. She serves as an Associate Editor for the *Journal of Heat and Mass Transfer* and has been a visiting professor at Princeton University, Ecole Polytechnique, and Tsinghua University. Dr. Sun recently co-chaired the 2025 Gordon Research Conference on Micro and Nanoscale Phase Change Phenomena and leads an NSF REU Site on American Leadership of Industry with Zero Emissions.

WEDNESDAY, JULY 9 **9:00AM–10:00AM**
WESTMINSTER BALLROOM IV

Junhong Chen, Ph.D.
Crown Family Professor of Molecular Engineering
University of Chicago
Lead Water Strategist and Senior Scientist
Science Leader for Argonne in Chicago
Argonne National Laboratory

Keynote Title: The Circular Water Economy: Addressing the Global Water-Energy Nexus Challenge

Abstract: The global demand for freshwater continues to rise due to economic growth and urbanization, while available supplies are increasingly limited, resulting in heightened water stress worldwide. At the same time, water and energy are deeply interconnected: water is required for energy production, and energy is needed for water production. In the U.S., municipal wastewater treatment alone consumes approximately 3% of the nation's electricity, yet only about 10% of the treated water is recovered and reused. To address these challenges, this presentation proposes a circular water economy vision that optimizes the water-energy nexus by recovering and reusing critical resources—such as critical minerals, nutrients, organics, and freshwater—for sustainable purposes. A key enabler of this circular economy is the availability of low-cost, real-time water quality monitoring. Current detection methods for critical water contaminants are often expensive or unsuitable for *in situ*, real-time analysis. To overcome these limitations, this talk will introduce an innovative approach for real-time water sensing, leveraging the molecular engineering of 2D nanomaterials in a field-effect transistor (FET) platform. The sensor works by detecting changes in the electrical conductivity of the 2D nanomaterial channel, which occurs when chemical or biological species bind to molecular probes anchored on the nanomaterial's surface. This enables precise detection of a wide range of analytes—including PFAS, heavy metals, bacteria, and nutrients—by measuring changes in the sensor's resistance. This patented technology offers a powerful solution for real-time detection of contaminants with high sensitivity and selectivity, suitable for both one-time testing and continuous, in-line monitoring in field settings. The presentation will explore the molecular engineering behind this sensor, focusing on the design of the nanomaterial channel and the molecular probes, through both theoretical models and experimental results. Finally, the talk will conclude with a discussion on the translation of this platform from concept to prototype product, highlighting industry partnerships that are driving its commercial development.

Biography: Junhong Chen is currently the Crown Family Professor of Pritzker School of Molecular Engineering at the University of Chicago and Lead Water Strategist & Senior Scientist at Argonne National Laboratory. He also serves as the Science Leader for Argonne's presence in the City of Chicago (Argonne in Chicago). Since March 1, 2024, Dr. Chen has been serving as the Co-PI and Use-inspired R&D Lead for the NSF Great Lakes ReNEW Water Innovation Engine. Prior to coming to Chicago, Dr. Chen served as a program director for the Engineering Research Centers program of the U.S. National Science Foundation (NSF) and the director of NSF Industry-University Cooperative Research Center (I/UCRC) on Water Equipment & Policy (WEP). He founded NanoAffix Science LLC to commercialize real-time water sensors based on 2D nanomaterials. Dr. Chen received his Ph.D. in mechanical engineering from University of

Keynote Speakers

Minnesota in 2002 and was a postdoctoral scholar in chemical engineering at California Institute of Technology from 2002 to 2003. His current research focuses on nanomaterial innovation for sustainable energy and environment. Dr. Chen has published 300 journal papers and has been listed as a highly cited researcher (top 1%) in materials science/ cross-field by Clarivate Analytics. He is an elected fellow of Royal Society of Chemistry, National Academy of Inventors, and the American Society of Mechanical Engineers.

THURSDAY, JULY 10 **8:00AM–9:00AM**
WESTMINSTER BALLROOM IV

Jason Woods, Ph.D.
Sr. Research Engineer
National Renewable Energy Laboratory (NREL)

Keynote Title: Air Conditioning in Buildings: Challenges and New Approaches

Abstract: This presentation explores the longstanding challenge of air conditioning for buildings. It begins with an overview of the vapor compression cycle—a 150-year-old technology used in most air conditioning systems—and the key barriers to enhancing its performance. It also discusses the impact air conditioning has on global energy use and the challenges it makes for the electric grid. The talk then briefly reviews various options for improving vapor compression efficiency, with a particular focus on dehumidification. It will then discuss open-absorption cooling systems, which offer a novel approach for efficient air conditioning and enables inherent energy storage.

Biography: Dr. Jason Woods is a Distinguished Researcher in NREL's Advanced Building Equipment Research Group. His expertise is in heat and mass transfer and phase change processes, with applications to air conditioning, heat pumps, thermal energy storage, and dehumidification. He leads projects at NREL that connect system-level modeling with technology development and experimental research. Dr. Woods has 96 publications and has been issued 12 U.S. patents in building HVAC-related technologies, with one of these receiving an R&D100 Award.

TUESDAY, JULY 8 **8:00AM–9:00AM**
WESTMINSTER BALLROOM IV

Energy Policy and Industry Perspectives

Join us for an engaging panel session on "Energy Policy and Industry Perspectives," where we will explore the impacts of recent energy policies and legislation on the landscape of sustainable energy technologies. Legislation such as the Bipartisan Infrastructure Law (2021) and the Inflation Reduction Act (2022) have catalyzed significant research and development efforts across the energy sector, driving innovation in sustainable energy technologies. More recent policies may redirect focus toward other energy technologies and away from renewable technologies. Our panel of experts will discuss how industry is adapting to these changes, navigating both opportunities and challenges as they strive to align with evolving energy policies.

This session is designed for researchers, engineers, and practitioners from academia, national labs, government, and industry who are eager to understand the evolving energy policy landscape and its implications for technological advancement. Attendees will gain valuable insights into industry directions and priorities arising from these policies. The goal is to foster a collaborative dialogue that enables attendees to better align their efforts with industry needs, ultimately contributing to the development of effective solutions that support both regulatory goals and market demands.

Questions from the audience will be encouraged.

Panelists:

Christopher Worley
Senior Director of Public Policy
Sunrun

Ashwin Salvi
Co-Founder|
AtmosZero

Steven Christensen
Director Innovation & Commercialization
Xcel Energy

Alicia Lindauer
Energy Resources Program Coordinator
U.S. Geological Survey

Moderators:

Clifford Ho, Ph.D.
Senior Scientist, Sandia National Laboratories, Alburquerque, New Mexico
ASME Fellow

Rohini Bala Chandran, Ph.D.
Associate Professor, Mechanical Engineering
University of Michigan

Panels

WEDNESDAY, JULY 9 **8:00AM–9:00AM**
WESTMINSTER BALLROOM IV

AI/ML Applications for High Performance and Resilient Buildings and Cities

Organized by: *ASME Journal of Engineering for Sustainable Buildings and Cities*

As the urgency to create high-performance buildings and resilient and healthy urban environments grows, artificial intelligence (AI) and machine learning (ML) are emerging as powerful tools for optimizing building performance, enhancing energy efficiency, and informing data-driven urban planning. This panel brings together leading experts from academia and industry to explore the latest advancements in AI/ML applications for high-performance and resilient buildings and cities.

Discussions will cover a range of critical topics, including predictive energy modeling, AI-driven optimization of HVAC and building controls, smart grid integration, climate-adaptive energy infrastructure planning, and the role of digital twins in improving building operation as well as energy performance.

Panelists will also address key challenges such as data availability, scalability, and the practical implementation of AI-driven solutions in the built environment.

Attendees will gain insights into how AI and ML are shaping the future of energy efficient and resilient urban development and the opportunities for interdisciplinary collaboration in driving innovation at the intersection of technology, engineering, and environmental science.

The panel will be proceeded by a Special Issue on the *ASME Journal of Sustainable Buildings and Cities*.

Panelists:

Troy Harvey
CEO and Co-Founder
PassiveLogic

Brian Freeman
Lead Data Scientist
Trane Technologies

Hohyun Lee
Professor and Department Chair
San José State University

Juan Pablo Montoya-Rincon
Postdoctoral Associate
University at Albany

Moderator:

Hamidreza Najafi
Associate Professor
Florida Institute of Technology

THURSDAY, JULY 10 **9:00AM–10:00AM**
WESTMINSTER BALLROOM IV

Long Duration Energy Storage (LDES) Technologies

Organized by: National Consortium for Advancing Long Duration Energy Storage (LDES) Technologies

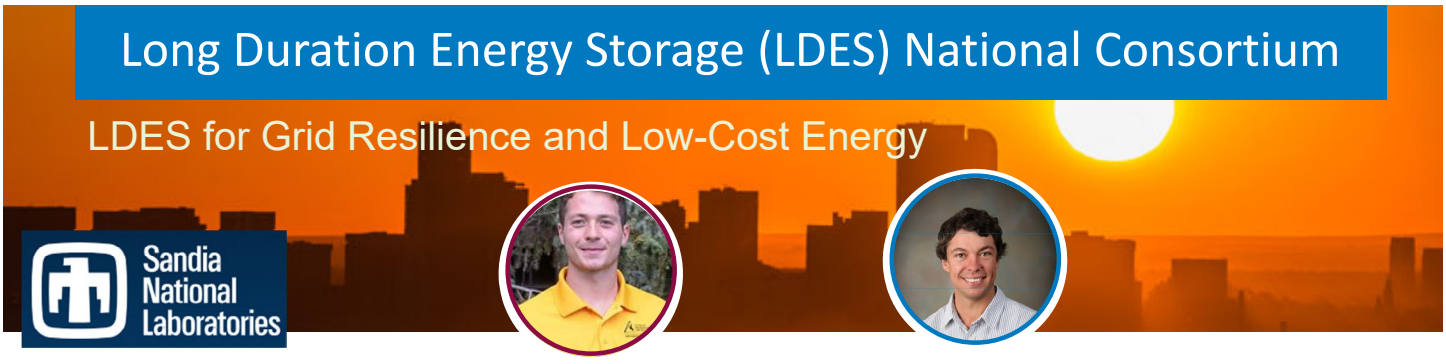
The Long-Duration Energy Storage (LDES) National Consortium provides a forum through which stakeholders across the LDES ecosystem can convene to identify barriers, determine potential synergies, and collaboratively develop and implement strategies necessary to achieve LDES technology commercialization within the next decade. The LDES National Consortium is comprised of National Laboratory and U.S. industry and community stakeholders, known as "Teaming Partners." A Leadership Team powered by the knowledge, expertise, and relationships possessed by six U.S. National Laboratories guides a broad network of Teaming Partners to collaboratively develop a set of actionable recommendations to address identified challenges facing LDES technologies. Teaming Partners play a critical role in this LDES National Consortium by helping to define the key questions, issues, and outcomes that the LDES National Consortium must address to support the commercialization of LDES technologies. Currently, the Consortium has 180+ teaming partners and continues to grow.

This panel will introduce activities and outcomes of the LDES National Consortium that dealt with 11 challenges for LDES commercial "lift-off." Panelists will discuss the challenges that must be addressed in order for LDES technologies to overcome commercialization barriers when a specific LDES technology and/or the LDES ecosystem is deemed to be self-supporting (i.e., no longer reliant on public funding) as deemed by empirical evidence, such as cost performance, improved round-trip efficiency (RTE) levels, increased levels of private investments in technologies or projects, increased numbers of LDES projects, etc. The output from the LDES National Consortium is a comprehensive plan for LDES commercialization that can be offered to diverse regions, markets, communities, and end-use customers.

There will also be a Q&A session between the panelists and the audience regarding the Consortium as well as broader topics in LDES.

Moderator:

Like Li, Ph.D.
Associate Professor of Mechanical Engineering
University of Central Florida



Luke McLaughlin, Ph.D.
Development and Evaluation Team Lead

Henk Laubscher, Ph.D.
Demonstration and Deployment Team Lead

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Rebecca Barney, Ph.D.
Customer Adoption Team Lead

Jeffrey Gifford, Ph.D.
Investment Confidence & Financing Team Lead

Zhiwen Ma, Ph.D.
Use Case Development Team Lead

Guangdong Zhu, Ph.D.
GeoTES for LDES and Data Center Project Lead

Networking and Special Sessions

SPECIAL SYMPOSIUM IN HONOR OF PROF. JANE DAVIDSON

You are cordially invited to participate in a special symposium to honor Prof. Jane Davidson during the ASME 19th International Conference on Energy Sustainability 2025. Prof. Davidson has made seminal contributions to ASME, the Solar Energy Division, and both low- and high-temperature solar thermal energy. She retired from the University of Minnesota in 2022. We are privileged to honor her in this symposium.

SESSION 1 - TUESDAY, JULY 8 | 10:20AM–12:00PM
SESSION 2 - TUESDAY, JULY 8 | 3:30PM–5:10PM
SESSION 3 - WEDNESDAY, JULY 9 |10:20AM–12:00PM
SESSION 4 - WEDNESDAY, JULY 9 | 3:30PM–5:10PM
SESSION 5 - THURSDAY, JULY 10 | 10:20AM–12:00PM

WESTMINSTER BALLROOM II

Symposium Organizers

- **Prof. Julia Nicodemus,** *Lafayette College*
- **Prof. Luke J. Venstrom**, *Valparaiso University*
- **Prof. Peter Krenzke,** *Valparaiso University*
- **Prof. Adam Gladen,** *North Dakota State University*
- **Prof. Rohini Bala Chandran**, *University of Michigan*

ES/SHTC NEWCOMER SOCIAL

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

All first-time attendees of the Energy Sustainability & 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 ACTIVITIES

In addition to offering the ES 2025 Student Registration Fee Scholarship, ES2025 features activities dedicated to students, including the Poster Presentation Session, Lightning Talks, and the Career Panel. These activities will be available to all student registrants.

Be sure to join the Solar Energy Division (SED) and Advanced Energy Systems Division (AESD) Awards Luncheon to support the Student Paper Award and Graduate Student Award winners! The Awards Luncheon is open to all ES25 registrants.

POSTER PRESENTATIONS

MONDAY, JULY 15 **12:00PM–1:30PM**
LEGACY BALLROOM AND FOYER

Please join us to support ES students and presenters during this poster presentation. Grab a box lunch and visit with our poster authors.

LIGHTNING TALKS

TUESDAY, JULY 8 **5:15PM–6:15PM**
WINDSOR

All participants are welcome! The Lightning Talks session provides a forum for practicing scientific communication skills, networking, and community building. We invite interested participants to deliver short (<5 mins) presentations/elevator pitches, with or without slides, to showcase and introduce their research, advertise for open jobs/research positions, seek research collaborators, learn more about participating in organizing the ASME-ES conference, and get feedback on work-in-progress or any roadblocks that you've run into in research.

ES/SHTC CAREER PANEL

WEDNESDAY, JULY 9 **5:20PM–6:20PM**
GRAY'S PEAK

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 regarding career decisions.

POWER HOUR

THURSDAY, JULY 10 **3:30PM–5:10PM**
WESTMINSTER BALLROOM II

Free-form discussion open to everyone, designed to address the interests and needs of all scientists and the challenges they face in their careers. Specifically, the program promotes meaningful conversations amongst colleagues of all career stages about barriers to career advancement and strategies to support the professional growth of all members of the community. Modeled after the GRC Power Hour.

The ASME Advanced Energy Systems Division and Solar Energy Division are pleased to present six awards in two categories to the participants of the ES 2025. The recipients will be recognized at the Solar Energy Division (SED) and Advanced Energy Systems Division (AESD) Awards Luncheon on Wednesday, July 9, from 12:00PM to 1:30PM.

OUTSTANDING PAPER AWARD

To promote high quality research contributions in the field of Energy Sustainability, up to three outstanding papers will be recognized for their originality, impact, clarity, and elegance. The selection will be based on input from the reviewers, track chairs, and the organizing committee.

OUTSTANDING STUDENT-LED PAPER AWARD

To promote the contributions of undergraduate and/or graduate students in the field of Energy Sustainability, up to three outstanding papers featuring students as lead author(s) will be recognized for their originality, impact, clarity, and elegance. The selection will be based on input from the reviewers, track chairs, and the organizing committee.

Track Organizers

THANK YOU! Thank you to our Track Organizers! Without their dedication and time commitment, ES could not be a successful conference.

TRACK NUMBER	TRACK NAME	TRACK CHAIR & CO-CHAIR
1	Decarbonizing Energy, Water, and Chemicals	Rohini Bala Chandran, *University of Michigan*
2	AI for Energy Sustainability	Shima Hajimirza, *Stevens Institute of Technology* John Tencer, *Sandia National Laboratories*
3	Sustainable Buildings, Communities, and Cities	Abdlmonem H. Beitelmal, *Journal of Engineering for Sustainable Buildings and Cities / Qatar Environment and Energy Research Institute – Environment and Sustainability Center* Hamidreza Nafaji, *Florida Institute of Technology*
4	Energy Storage Separate from CSP: Thermal, Mechanical, Thermochemical	Nick AuYeung, *Oregon State University* Abhishek Singh, *University of Twente*
5	Research for the Clean Energy Transition (Socio-technical, Education, and Policy)	Gowtham Mohan, *University of Houston*
6	Concentrating Solar Power 1: Optical Systems, Receivers and Reactors	Jeremy Sment, *Sandia National Laboratory* Munjal Shah, *National Renewable Energy Laboratory*
7	Concentrating Solar Power 2: Heat Exchangers, Energy Storage System, and the Power Block	Alon Lidor, *National Renewable Energy Laboratory* Jesse Fosheim, *Brayton Energy*
8	Concentrating Solar Power 3: Technoeconomics, Lifecycle Analyses, Balance of Plant	Alexander Zolan, *National Renewable Energy Laboratory* Shaun Sullivan, *Brayton Energy*
9	Solar Chemistry: Thermochemistry, Photocatalysis, and Photo-electrocatalysis	Remo Schappi, *Massachusetts Institute of Technology*
10	Photovoltaic, Photovoltaic-Thermal, and Electrochemical Technologies	Sidong Lei, *University of Central Florida*
11	Alternative Energy Conversion Technology (including Wind, Geothermal, Hydro, and Ocean)	Gang Li, *Mississippi State University*
12	Process Heat for Desalination and Industrial Decarbonization	Akanksha Menon, *Georgia Institute of Technology* Kerry Rippy, *National Renewable Energy Laboratory*
13	Hydrogen Energy, Alternative Fuels, Bioenergy, and Biofuels	Jian Zhao, *Mississippi State University*
14	Carbon Capture & Cleaner Fossil Fuel Technologies	Hanping Ding, *University of Oklahoma* Yudong Li, *National Renewable Energy Laboratory*
15	Materials and Processes for Sustainable Manufacturing	Ben Xu, *University of Houston* Prashant Singh, *University of Tennessee, Knoxville*
16	Lightning Talks	Rohini Bala Chandran, *University of Michigan* Sarvenaz Sobhansarbandi, *California State University, Sacramento*
17	Poster Presentations	Andrew Schraeder, *University of Dayton* Sarvenaz Sobhansarbandi, *California State University, Sacramento*
18	Advanced Materials for Sustainability	Yingchao Yang, *University of Missouri*
19	Symposium to Honor Professor Jane Davidson	Julia Nicodemus, *Lafayette College* Adam Gladen, *North Dakota State University* Peter Krenzke, *Valparaiso University* Rohini Bala Chandran, *University of Michigan*

Session Organizers

SESSION TITLE	SESSION ORGANIZER
01-01: Decarbonizing Industrial Processes	Rohini Bala Chandran
01-02: Decarbonizing Commodity Chemicals and Emissions Analyses	Mark Hamalian
02-01: AI for Energy Sustainability I	Shima Hajimirza
02-02: AI for Energy Sustainability II	Ben Xu
03-01: Advances in Indoor Environment Technologies and Solutions	Philip Adebayo
03-02: Innovative Building Material and Technologies	Hamidreza Nafaji
03-03: Building Performance Simulations for Sustainable Solutions	Hamidreza Nafaji
03-04: Innovative Strategies and Energy Storage for Resilient Communities	Philip Adebayo
03-05: Advances in Renewable Energy and Integration	Hailei Wang
03-06: Heat Pump Technologies for Sustainable Solutions	Shin Young Jeong
04-01: Energy Storage Systems and Applications	Prashant Saini
04-02: Particles and Materials for Energy Storage	Juvenal Ortiz-Ulloa
04-03: Thermomechanical Energy Storage	Nick AuYeung
06-01: CSP Optical Systems	Jeremy Sment
06-02: CSP Receivers and Reactors I	Jeremy Sment
06-03: CSP Receivers and Reactors II	Munjal Shah
06-04: CSP Receivers and Reactors III	Shin Young Jeong
06-05: CSP Receivers and Reactors IV	Munjal Shah
07-01: Experimental Characterization of Particle Flows	Rhushikesh Ghotkar
07-02: Fluidized Bed Heat Exchangers	Jesse Fosheim
07-03: Thermal Energy Storage: Phase-Change and Thermochemical	Prashant Saini
07-04: Modeling of Thermal Energy Storage and Receiver Systems	Alon Lidor
08-01: Deployment and Analysis of CSP Subsystems	Shaun Sullivan
08-02: Technoeconomic Analysis of CSP and Thermal Energy Storage Systems	Alexander Zolan
09-01: Solar Chemistry I	Remo Schappi
09-02: Solar Chemistry II	Remo Schappi
09-03: Solar Chemistry III	Shang Zhai
09-04: Solar Chemistry IV	Shang Zhai
10-01: Photovoltaic, Photovoltaic-Thermal, and Electrochemical Technologies I	Sidong Lei
10-02: Photovoltaic, Photovoltaic-Thermal, and Electrochemical Technologies II	Sidong Lei
11-01: Alternative Energy Conversion Technology (including Wind, Geothermal, Hydro, and Ocean)	Gang Li
12-01: Process Heat for Desalination	Akanksha Menon
12-02: Process Heat for Industrial Decarbonization	Akanksha Menon

Session Organizers

SESSION TITLE	SESSION ORGANIZER
13-01: Hydrogen and Fuel Cells	Jian Zhao
13-02: Hydrogen Production and Storage	Jian Zhao
13-03: Alternative Fuel Production and Utilization I	Jian Zhao
13-04: Alternative Fuel Production and Utilization II	Hailei Wang
14-01: Carbon Capture & Cleaner Fossil Fuel Technologies I	Mohammad Asaduzzaman Chowdhury
14-02: Carbon Capture & Cleaner Fossil Fuel Technologies II	Marie-Odile Forier
18-01: Advanced Materials for Sustainability	Paul Sze Hou Loh
19-01: Symposium to Honor Professor Jane Davidson I	Julia Nicodemus
19-02: Symposium to Honor Professor Jane Davidson II	Adam Gladen
19-03: Symposium to Honor Professor Jane Davidson III	Peter Krenzke
19-04: Symposium to Honor Professor Jane Davidson IV	Luke Venstrom
19-05: Symposium to Honor Professor Jane Davidson V	Rohini Bala Chandran

Author Index

LAST NAME	FIRST NAME	PAPER NUMBER	PAPER TITLE	SESSION
Abdelmesih	Bahy	164629	Shading Impacts on the Abernethy Physical Education Center Photovoltaic System: A Case Study of Catawba College Campus	17-01: Poster Presentations
Adebayo	Philip	152218	Experimental Characterization of Low Temperature Borehole Thermal Energy Storage System: A Case Study	04-01: Energy Storage Systems and Applications
Aikman	Andrew	169830	Sizing of Standalone Residential Battery Energy Storage Systems	03-04: Innovative Energy Storage Solutions for Resilient Communities
Akhozheya	Boshra	155263	Enhancing Hygrothermal Performance of Building Envelopes in Cold Climates	03-01: Advances in Indoor Environment Technologies and Solutions
Akhozheya	Boshra	156167	Prioritizing Energy Efficiency Over Renewable Dependence in Nzebs: A Comparative Analysis of Effective Envelope Retrofitting for Hot and Humid Regions	03-05: Advances in Renewable Energy and Integration
Alfarhan	Abdullah	166469	Numerical and Design Analysis of Free and Obstructed Falling Particle Receivers in Solar Tower Systems	06-02: CSP Receivers and Reactors I
Alfarhan	Abdullah	169951	Design, Modeling, and Testing of Optimized Metallic Porous Structure for Passive Pumping in Dual-Use Solar-Thermal Desalination System	12-01: Process Heat for Desalination
Alfulayyih	Yasir	151773	Modeling an Algorithm for Sizing a Hybrid System of Solar Pv and Wind Turbine and Hydrogen Energy Storage System for Reliable Year-Round Power Supply: Application of “Sity” Weather Year Format	11-01: Alternative Energy Converstion Technology (including Wind, Geothermal, Hydro, and Ocean)
Ali	Mohamed	156191	Waste Heat Recovery With Carbon Capture for Sustainable Aluminum Smelter Operation	01-01: Decarbonizing Industrial Processes
Ali	Mohamed	156365	Novel New Thermal Insulation and Sound Absorption Materials Derived From Agro/medical Wastes	03-02: Innovative Building Material and Technologies
Alsahbool	Sharif	163806	Enhancing Post-Combustion Carbon Capture Efficiency via Solvent Degradation Mitigation and Process Optimization	14-02: Carbon Capture & Cleaner Fossil Fuel Technologies II
Alshehri	Ahmed	155688	Prediction of Circumsolar Ratio Using Solar Radiation Data and Clear Sky Model	06-01: CSP Optical Systems
Anika	Miskat Islam	169938	Moving Packed-Bed Counter-Flow Reactor for Solar Propane Dehydrogenation	09-02: Solar Chemistry II
Anjum	Navid	155568	Impact of Cycling on the Structure of Crystal Nanocellulose-Salt Composite Materials for Thermal Energy Storage	19-04: Symposium to Honor Professor Jane Davidson IV
Arifianti	Qurrotin	155123	Sustainable Hydrogen Production From Plastic Waste via Plasma Gasification and Carbon Capture Integration: A Combined Thermodynamic and Economic Assessment	14-01: Carbon Capture & Cleaner Fossil Fuel Technologies I

Author Index

LAST NAME	FIRST NAME	PAPER NUMBER	PAPER TITLE	SESSION
Arnow	Hannah	156776	Evaluating Vertical Building Integrated Photovoltaics With Standard Performance Metrics	03-03: Building Performance Simulations for Sustainable Solutions
Arnow	Hannah	157640	Effects of Ground and Diffuse Solar Illumination on the Performance of Luminescent Solar Concentrators With Asymmetric Light Transmitting Interface	03-02: Innovative Building Material and Technologies
Asadi	Armin	169851	Reduced Order Modeling of a Fluidized-Bed Solar Receiver for Perovskite-Based Thermochemical Energy Storage	06-04: CSP Receivers and Reactors III
Baghaei Lakeh	Reza	156826	Computational Investigation of a Electro-Thermal Energy Storage System Utilizing Processed Desalination Salt as Heat Storage Medium	12-01: Process Heat for Desalination
Bala Chandran	Rohini	169840	Hot, Flowing, and Reacting Particles, Oh My!	19-02: Symposium to Honor Professor Jane Davidson II
Ballatore	Marco	169590	Thermochemical Heat Transformers for Industrial Heating Applications	04-03: Thermochemical Energy Storage
Baral	Nawa	157807	Leveraging Oxygen Byproduct From Water Electrolysis for Accelerated Decarbonization in Biorefineries	13-04: Alternative Fuel Production and Utilization II
Barbosa	Erik	169418	Salt Hydrate – Mesoporous Silica Composites for Thermochemical Energy Storage in Buildings	04-03: Thermochemical Energy Storage
Beitelmal	Monem	157011	Improving Indoor Environmental Quality and Occupant Wellbeing: Introducing a Holistic Iot-Integrated Platform for Real-Time Monitoring and Management of Air Quality and Comfort	03-01: Advances in Indoor Environment Technologies and Solutions
Bhattacharya	Shounak	168175	Progress Toward Hydrogen Burning Free-Piston Linear Generator	13-04: Alternative Fuel Production and Utilization II
Blackley	Erin	164842	Making Small-Volume Heat Pump Water Heaters Larger: A Design Framework for Integrated Phase Change Material Heat Exchangers	17-01: Poster Presentations
Boetcher	Sandra	170074	Transforming Thermal Energy Storage Systems With Additive Manufacturing	19-04: Symposium to Honor Professor Jane Davidson IV
Bokhary	Yahya	170041	Two-Fluid Modeling of Narrow-Channel Fluidized Bed Heat Transfer for Particle Heat Exchangers and Receiver	07-04: Modeling of Thermal Energy Storage and Receiver Systems
Boonman-Morales	Brecht	156139	Development of L-Valve Particle Metering Correlation for Thermal Energy Storage	04-02: Particles and Materials for Energy Storage
Bounaim	Doha	156886	Time-Series AI Forecasting of Wind-to-Hydrogen Production	02-02: AI for Energy Sustainability II
Brewster	Keaton	156002	Impacts of Pulsed Fluidization on Heat Transfer and Bubble Hydrodynamics in Bubbling Fluidized Beds	06-02: CSP Receivers and Reactors I
Brown	Taylor	169645	Technoeconomic Analysis of Supercritical Carbon Dioxide Power Cycle Designs for Particle-Based Csp Systems	08-02: Technoeconomic Analysis of CSP and Thermal Energy Storage Systems

LAST NAME	FIRST NAME	PAPER NUMBER	PAPER TITLE	SESSION
Chen	Junhong	169503	The Circular Water Economy: Addressing the Global Water-Energy Nexus Challenge	19-05: Symposium to Honor Professor Jane Davidson V
Chen	Renkun	170051	Measurement, Understanding, and In-Situ Diagnostics of Thermal Transport in Moving Particles Using Modulated Photothermal Radiometry	07-01: Experimental Characterization of Particle Flows
Chiteka	Kudzanayi	156602	Exploring the Impact of Environmental and Dust Thermophysical Properties on Soiling Thermal Losses of Solar PV Modules	10-02: Photovoltaic, Photovoltaic-Thermal, and Electrochemical Technologies II
Chowdhury	Mohammad Asaduzzaman	155278	Modeling Co_2 Adsorption in Nanoporous Materials for Efficient Carbon Capture: A DFT Approach	14-01: Carbon Capture & Cleaner Fossil Fuel Technologies I
Chowdhury	Mohammad Asaduzzaman	156214	A First Principle Analysis Advancing Sustainable Catalysts for Industrial Applications.	13-03: Alternative Fuel Production and Utilization I
Chowdhury	Shovan	156681	Urbanflow: Community Spatial Building Energy Data Visualization & Analytics	03-01: Advances in Indoor Environment Technologies and Solutions
Chowdhury	Shovan	156691	Quantifying and Zoning Urban Heat Island Effects Using Unsupervised Machine Learning	02-01: AI for Energy Sustainability I
Chu	Byeongrok	156310	Modeling and Analysis of Pemfc and Recirculation System in Air-Independent Environment	13-01: Hydrogen and Fuel Cells
Ciez	Rebecca	161884	Energy and Climate Impacts of Electrification of the Steel Industry	01-01: Decarbonizing Industrial Processes
Cordova-Garcia	Jose	156091	Evaluating Neural Network-Based Energy Forecasting With Mixed Variables and Limited Data	02-01: AI for Energy Sustainability I
Cordova-Garcia	Jose	156600	Clustering Buildings Energy Consumption for Personalized Lightweight Forecasting	02-02: AI for Energy Sustainability II
Daniel	Lea	156301	Analyzing a Hydrogen Trucking Transportation Corridor From Houston to Los Angeles	13-01: Hydrogen and Fuel Cells
Derenchuk	Alex	168354	Decomposing a Large-Scale Linear Program for Power Sector Capacity Planning	17-01: Poster Presentations
Dhakal	Diwash	160863	Evolution of Elemental Distribution in Structural Alloys Exposed to High Temperature and $MgCl_2$ PCM as Revealed by High Resolution X-Ray Fluorescence	04-02: Particles and Materials for Energy Storage
Dogue	Sebastian	170008	Design and Layout of a 100-Kw Scale Receiver Test Facility Using an Available Tower	06-01: CSP Optical Systems
Domantay	Janelle	168085	Maximizing Hot Water Availability: An Optimization Model for Minimizing Unmet Demand in Small-Volume Heat Pump Water Heaters	17-01: Poster Presentations
Duval	Christine	156086	Performance Assessment of a Solar Assisted Micro-Radiant Heating System Using TRNSYS	03-04: Innovative Energy Storage Solutions for Resilient Communities

Author Index

LAST NAME	FIRST NAME	PAPER NUMBER	PAPER TITLE	SESSION
Egunjobi	Rabi	169899	Assessing $C0_2$ Emissions and Negative Externalities of Different Beverage Packaging Systems in the US: A Lifecycle Analysis and Policy Implications	01-02: Decarbonizing Commodity Chemicals and Emissions Analyses
Fahim	Muhammad	169792	Entropy-Engineered Polymer Aerogels Shatter Solar Reflectivity Limits	03-02: Innovative Building Material and Technologies
Farias	Mathew	157905	Process Parameter Prediction of In718 SLM Produced Specimen Using Neural Networks Based on As-Printed Surface Finish	06-05: CSP Receivers and Reactors IV
Farias	Mathew	157908	Integrated Design and Analysis of CSP Towers for Wind Resilience and Cost Efficiency	08-01: Deployment and Analysis of CSP Subsystems
Feng	Leshi	169960	Non-Evaporative Drying Using Thermo-Responsive Polymers	17-01: Poster Presentations
Firdous	Irum	169796	Precipitation-Powered Radiative Cooling Windows: Multi-Junction Triboelectric Nanogrid for Dual-Function Energy Autonomy	03-02: Innovative Building Material and Technologies
Fortier	Marie-Odile	169690	Carbon Footprint of Electricity Generation From Waste Coal	14-02: Carbon Capture & Cleaner Fossil Fuel Technologies II
Fosheim	Jesse	164434	Development and Demonstration of a Novel High-Performance Particle-Supercritical Carbon Dioxide Heat Exchanger Employing Plate-Fin Bubbling Fluidized Beds	07-02: Fluidized Bed Heat Exchangers
Fosheim	Jesse	169966	Thermal Energy Storage and Exchange With Integrated Rotating Media Transport (Sandewirm)	17-01: Poster Presentations
Fowler	Jacob	168578	Evaluation of Levelized Cost of Storage for Novel Rotating Particle Storage Technology	04-02: Particles and Materials for Energy Storage
Gamil	Ahmed	169998	Optimal Heliostat Size Analysis for a Solar Thermal Industrial Process Heat (IPH) Business Case	08-01: Deployment and Analysis of CSP Subsystems
Garimella	Srinivas	169488	(Invited)The Thermally Driven Heat Pump: A Most Versatile Tool to Decarbonize at Scale	19-03: Symposium to Honor Professor Jane Davidson III
Garraway	David	156280	A Design of a Transcritical CO_2 Heat Pump for Heating, Cooling and Hot Water Services in Temperate Climates	03-06: Heat Pump Technologies for Sustainable Solutions
Ghadge	Yogesh	169602	Exploring the Impact of Thermodynamic Properties on Kinetic Behavior of LSMG Perovskites for Thermochemical Hydrogen Production	09-01: Solar Chemistry I
Ghaith	Fadi	157792	Solar Powered Distillation System in Dairy Effluent Treatment	12-02: Process Heat for Industrial Decarbonization
Ghotkar	Rhushikesh	156297	Modeling of a Countercurrent Regenerative Chemical Looping Reactor for the Reverse Water-Gas Shift Reaction	09-03: Solar Chemistry III
Gifford	Jeffrey	164864	Integration and Efficiency Analysis of High-Temperature Concentrated Solar Thermal Receivers Into Various Industrial Processes	06-05: CSP Receivers and Reactors IV

LAST NAME	FIRST NAME	PAPER NUMBER	PAPER TITLE	SESSION
Gifford	Jeffrey	169335	Solar Thermal Energy Planner (Step 1): A New Web-Based Decision Support Tool for Solar+Storage Systems for Industrial Energy Demands	12-02: Process Heat for Industrial Decarbonization
Gong	Jiawei	156881	Feature Engineering for Optimizing Perovskite Solar Cells Using Perovskite Database Project Data	10-02: Photovoltaic, Photovoltaic-Thermal, and Electrochemical Technologies II
Gorji	Mazdak	158471	Comparison of Different Solar to Electric Power Options for 24 Hours Continuous Power Supply	04-01: Energy Storage Systems and Applications
Grobbel	Johannes	169543	Extended Dem Simulations of Particle Motion and Heat Transfer in Solar Reactor Systems With Metal Oxide Particles	09-02: Solar Chemistry II
Gupta	Ashwani	157794	Effect of Operational Parameters on Supercritical CO_2 Assisted Liquefaction of Pinewood	13-03: Alternative Fuel Production and Utilization I
Guy	Quin	168352	Cost and Benefits From Energy Retrofits and Electrification of Low-Income Residential Housing in Colorado	17-01: Poster Presentations
Hamalian	Mark	154935	Effects of Bubble Size and Density on CO_2 Hydrate Slurry Production for Carbon Sequestration	14-01: Carbon Capture & Cleaner Fossil Fuel Technologies I
Hamilton	William	168576	Characterizing the Impact of Heliostat Size, Focus Method, and Optical Error on Concentrating Solar Tower Systems	06-05: CSP Receivers and Reactors IV
Han	Insung	157550	Thermal Cycling-Induced Degradation of Al-Si Eutectic Phase Change Material Through Interaction With SS304 by a Multi-Modal Approach	07-03: Thermal Energy Storage: Phase-Change and Thermochemical
Hartner	Anton	156065	Experimental Assessment of a Counter Current Particle-Air Solar Receiver	06-05: CSP Receivers and Reactors IV
Hasnain	Umair	166353	Application of Radiant Cooling Coatings in Air Conditioning Package Units	01-01: Decarbonizing Industrial Processes
Hathaway	Brandon	169856	Solar Steam With Thermal Energy Storage for Renewable Fuel Production	19-02: Symposium to Honor Professor Jane Davidson II
Heidari Dehkordi	Behrooz	156864	Comparison of Torgas Production Between Traditional and Molten Salt Torrefaction Using In-Situ Raman Laser Gas Analysis	13-03: Alternative Fuel Production and Utilization I
Hirschey	Jason	156684	Troubleshooting a Counterflow, Direct Contact, Solid-Air Heat Exchanger	07-02: Fluidized Bed Heat Exchangers
Hughley	Jasmine	156794	Prediction of Metastable States for Throttling in Pressure Relief Valves for Sustainable Carbon Dioxide Heat Pump Technologies	03-06: Heat Pump Technologies for Sustainable Solutions
Izquierdo	Julio	164856	Predicting Local Heat Transfer in Solid-Particle Gravity-Driven Fluidized Heat Exchangers Using Machine Learning	07-02: Fluidized Bed Heat Exchangers

Author Index

LAST NAME	FIRST NAME	PAPER NUMBER	PAPER TITLE	SESSION
Jackson	Gregory	168429	(Invited) An Honest Reflection on Fuels From Concentrating Sunlight: A Tribute to My Friend and Mentor Jane Davidson	19-01: Symposium to Honor Professor Jane Davidson I
Jeevaretanam	Barathan	155152	Kinetically Controlled Solar-Thermal Decomposition of Hydrocarbons via Direct Irradiation of a Porous Absorber	09-01: Solar Chemistry I
Jeong	Shin Young	169834	Investigation of Flux Spreading in a Light-Trapping, Planar-Cavity Receiver for Enclosed Solar Particle Heating	06-03: CSP Receivers and Reactors II
Jeong	Shin Young	169839	Characterization of High-Temperature Flow Properties of Solid Particles for Electrical Thermal Energy Storage	04-02: Particles and Materials for Energy Storage
Ji	Kristina	156795	An Analysis of Ground Screws for Heliostat Deployment: Design Proposal to Minimize Environmental Impacts and Reduce Permitting Burden	06-01: CSP Optical Systems
Johnson	Taylor	169893	Optimization and Techno-Economic Analysis of a Hybrid PV-CSP System With Thermal Energy Storage and sCO_2 Brayton Cycle	08-02: Technoeconomic Analysis of CSP and Thermal Energy Storage Systems
Joseph	Appertey	156129	Environmental Burden Predictive Tools for the Controlled Environment Agriculture Industry	03-04: Innovative Energy Storage Solutions for Resilient Communities
Just	Joshua	156382	Development and Demonstration of a Low Cost Optical Concentrator	06-01: CSP Optical Systems
Kandage	Thasanka	155317	Optimizing the Performance of Liquid-Based Medium-Temperature Volumetric Solar Thermal Receivers Using Genetic Algorithms: A Step Towards Digital Twinning	02-01: AI for Energy Sustainability I
Karg Bulnes	Fernando	155242	Tecno-Economic Analysis for Adoption of Largescale Renewable Microgrid Systems in Isolated Communities	03-05: Advances in Renewable Energy and Integration
Kassel	Drew	156289	Connectin' Texans to National Power Grids: Improving Reliability, Saving Money, and Avoiding CO_2 Emissions	01-02: Decarbonizing Commodity Chemicals and Emissions Analyses
Katakam	Vishnu Sree Shanthanu	169420	Thermodynamic and Techno-Economic Analysis of Produced Water Desalination Systems for Clean Hydrogen Production	13-02: Hydrogen Production and Storage
Kaundal	Ankur	156726	Numerical Investigation and Experimental Validation of Thermal Profile Over a Biomass-Based Heating System and Its Parametric Optimization	13-03: Alternative Fuel Production and Utilization I
Khalaf	Jawad	156809	Attrition Cycling of Thermally Aged Generation 3 Particle CSP Media	07-01: Experimental Characterization of Particle Flows
Khandaker	Md. Rifat	155196	Next-Gen Thermomechanical Energy Storage Materials: Computational Design of Carbon Nanotube and Borophene Structures	04-03: Thermochemical Energy Storage

LAST NAME	FIRST NAME	PAPER NUMBER	PAPER TITLE	SESSION
Khandaker	Md. Rifat	155258	Optimizing Hydrogen Adsorption on Palladium and h-BN for Advanced Storage Applications: A DFT Analysis	13-02: Hydrogen Production and Storage
Kianimoqadam	Alireza	169956	Dem and Simplified CFD Analysis via μ(I) Rheology of the Sandewirm, a Rotating Particle-based Thermal Energy Storage System	07-04: Modeling of Thermal Energy Storage and Receiver Systems
Kilb	Justin	168351	Estimating Value of Information for Heliostat-Washing Operations at Concentrating Solar Power Plants With Monte Carlo Simulation	08-01: Deployment and Analysis of CSP Subsystems
Kim	Dongsu	169880	Investigation of Energy Savings Potential and Cost-Effectiveness of Free Cooling Operation With Air-Source Chiller System for Data Centers	03-03: Building Performance Simulations for Sustainable Solutions
Kim	Dongsu	170032	Evaluation of Adaptive Façade Design for Daylight Managements: Simulation and Validation Using Rhino-Grasshopper	17-01: Poster Presentations
Kim	Minjung	156511	Nickel-Catalyzed Methane Reforming With Synergistic Cerium-Assisted Iron Oxidation in Chemical Looping Dry Reforming	13-02: Hydrogen Production and Storage
Koomson	Alfred	169934	Numerical Investigation of Different PCM Container Geometries for Optimizing Thermal Performance in High-Efficiency Refrigerators.	17-01: Poster Presentations
Krenzke	Peter	169465	Testing of the University of Minnesota Continuous Temperature-Swing Solar Thermochemical Reactor	19-01: Symposium to Honor Professor Jane Davidson I
Kumavat	Parth	156354	Numerical Design Optimization of a Compact Heat Exchanger Gas to Molten Salts for High Temperature Heat Pump Integration	12-02: Process Heat for Industrial Decarbonization
Laksana	Akbar	169873	Modeling of a Fluidized Catalyst Bed Receiver-Reactor for Solar Methane Reforming	06-04: CSP Receivers and Reactors III
Lapp	Justin	169946	Developing Educational Programs in Building Science at the University of Maine	02-02: AI for Energy Sustainability II
Lavigne	Dominic	169965	Transient, Reduced-Order Heat and Mass Transfer Modeling of the Sandewirm, a Rotating Particle-Based Thermal Energy Storage System	07-04: Modeling of Thermal Energy Storage and Receiver Systems
Lee	Hohyun	156331	Integrating Sociodemographics into Trip Chain Models for Residential EV Charging Schedule Simulation with LLMs	03-05: Advances in Renewable Energy and Integration
Lee	Kangjae	170062	3d Printing of Porous Redox Materials for Solar Thermochemical Fuel Production: Hierarchical Structure Optimization	17-01: Poster Presentations
Lei	Fuqiong	169874	Significant Heat Transfer Enhancement With Extended Surfaces in Narrow-Channel Fluidized Beds for Particle-Based CSP Applications	07-02: Fluidized Bed Heat Exchangers
Lesala	Mahali Elizabeth	164724	Hybrid Mini-Grids and Rural Energy Poverty: Sustainable Solutions for Socioeconomic Development in Upper Blinkwater, South Africa	17-01: Poster Presentations

Author Index

LAST NAME	FIRST NAME	PAPER NUMBER	PAPER TITLE	SESSION
Li	Bingjia	169963	DEM Modeling for Dense Moving Bed Heat Exchanger Inform Comprehensive New Nusselt–Peclet Number Correlations	07-04: Modeling of Thermal Energy Storage and Receiver Systems
Li	Hang	167553	Large Scale Building Energy Modeling With Energy Conservation Measures for Carbon Mitigation and Retrofit Paybacks	03-03: Building Performance Simulations for Sustainable Solutions
Li	Like	169660	Development of Reactive Particle Based Thermochemical Energy Storage System for Concentrating Solar-Thermal Power (TCES-CSP)	06-05: CSP Receivers and Reactors IV
Li	Like	170090	Continuum Modeling of Oxidation Reactor-Heat Exchanger in a Moving-Bed Thermochemical Energy Storage System for Concentrating Solar-Thermal Power (TCES-CSP)	07-03: Thermal Energy Storage: Phase-Change and Thermochemical
Liang	Lin	164917	A Novel Building Module With Dual-Mode Radiative Thermal Regulation	03-03: Building Performance Simulations for Sustainable Solutions
Liaqat	Kashif	156769	Feasibility Analysis of Implementing Small-Scale CSP System for Industrial Process Heat on Urban Brownfields	08-02: Technoeconomic Analysis of CSP and Thermal Energy Storage Systems
Liaqat	Kashif	156770	Techno-Economic Analysis of a Novel CSP and Sco_2-Based System for Waste Heat Recovery in Gas Turbine Power Plants	08-02: Technoeconomic Analysis of CSP and Thermal Energy Storage Systems
Lidor	Alon	169271	Techno-Economic Analysis of Solar Thermochemical Hydrogen Production: The Case of an RTS Integrated With TES	09-04: Solar Chemistry IV
Lim	Ock Taeck	167381	Numerical Investigations Reveal That the G-Ligament Network Offers the Best Performance, and Extends Pemfc Operational Range.	17-01: Poster Presentations
Lüchinger	Richard	157709	Cost Analysis and Standardization for Large Thermal Energy Storage Systems	03-01: Advances in Indoor Environment Technologies and Solutions
Luo	Changhao	169597	Photo-Electrochemical Reduction of CO_2 for Fuel Production Under Concentrated Solar Irradiation	09-04: Solar Chemistry IV
Ma	Zhiwen	166830	Prototype Development for a Light-Trapping Planar-Cavity Enclosed Particle Solar Receiver	06-04: CSP Receivers and Reactors III
Machbitz	David	156371	Kinetic and Transport Modeling of a Dry and Steam Methane Reforming Reactor in a Parabolic Trough Solar Collector	09-03: Solar Chemistry III
Mangum	John	156080	Multiscale, Multimodal Exploration of Degradation Mechanisms in Cobalt Oxide Thermochemical Materials Using Ex-Situ and In-Situ Electron Microscopy	04-03: Thermochemical Energy Storage
Mayfield	William	156364	An Enhanced Federated Learning Framework for Predictive Maintenance of Distributed Wind Systems	02-01: AI for Energy Sustainability I

LAST NAME	FIRST NAME	PAPER NUMBER	PAPER TITLE	SESSION
Maynor	Karey	155214	Carbon Dioxide Hydrate Formation-Based Carbon Capture From Mixtures of Carbon Dioxide and Nitrogen	14-01: Carbon Capture & Cleaner Fossil Fuel Technologies I
Maynor	Karey	155224	System-Level and Techno-Economic Analysis of Green Ammonia Production in the Permian Basin of Texas	13-03: Alternative Fuel Production and Utilization I
Mcclung	Caroline	169911	Effect of Capillary and Viscous Forces on Carbon Dioxide Desorption in Porous Adsorbent Layers	14-02: Carbon Capture & Cleaner Fossil Fuel Technologies II
Mckinney	Peter	169869	Early Work of Jane Davidson on Electrohydrodynamics	19-05: Symposium to Honor Professor Jane Davidson V
McLaughlin	Luke	170124	Multi-Variate Optimization of Generation 3 CSP Falling Particle Receivers Using High-Performance Computing	06-02: CSP Receivers and Reactors I
McLaughlin	Luke	170136	Optimizing Photovoltaic and Radial Packed Bed Thermal Energy Storage Systems for Cost-Effective and Reliable Heating	04-01: Energy Storage Systems and Applications
Mcmullen	Matthew	169987	Effects of Salt Weight Fraction on the Scaling of Thermochemical Energy Storage With $SrBr_2$-Vermiculite Composite Materials	04-03: Thermochemical Energy Storage
Miller	Fletcher	156921	On the Modeling of Carbon Particle Oxidation and Its Effects on Temperature Distribution in a Small Particle Heat Exchange Receiver	06-04: CSP Receivers and Reactors III
Miller	James	170029	Applying Solar Thermochemical Approaches to Ammonia Synthesis	19-01: Symposium to Honor Professor Jane Davidson I
Miranda Manon	Andres	164854	Efficient Generation of Solar Heat Up to 800°C Enabled by Curved Silica-Alumina Aerogels	06-03: CSP Receivers and Reactors II
Mishra	Rishav	155423	Numerical and Experimental Investigation of a Trailing Edge Noise Generated by NACA 0012 Airfoil at Low Reynolds Numbers	11-01: Alternative Energy Converstion Technology (including Wind, Geothermal, Hydro, and Ocean)
Mohamed	Ahmed	156678	Optimizing Aperture-to-Receiver Area Ratios in Multi-Flow Falling Particle Receivers	06-03: CSP Receivers and Reactors II
Mohammadi	Efat	156368	Experimental Study of Li-Ion Batteries Performance Under Realistic Loads	10-01: Photovoltaic, Photovoltaic-Thermal, and Electrochemical Technologies I
Montes	Omar	156735	Investigation of the Effects of Hydrogen Blending Into Natural Gas Systems	13-04: Alternative Fuel Production and Utilization II
Montes	Omar	156891	Hydrogen Blending in Gas Systems: Real-Gas Behavior and Thermodynamic Analysis for System-Level Optimization	17-01: Poster Presentations
Mouafik	Sara	168713	Levelized Cost of Energy Analysis of Wind Power Plants Using a CNN-LSTM Hybrid Prediction Model	11-01: Alternative Energy Converstion Technology (including Wind, Geothermal, Hydro, and Ocean)

Author Index

LAST NAME	FIRST NAME	PAPER NUMBER	PAPER TITLE	SESSION
Munz	Karlyle	169468	Instrumentation of a Manufactured Home Community to Verify Benefits of Electrification and Retrofits	17-01: Poster Presentations
Nagel	Jackson	156852	Computational Investigation of Using Micro-Encapsulated Phase Change Material in Direct Liquid Cooling of a Lithium-Ion Battery	10-01: Photovoltaic, Photovoltaic-Thermal, and Electrochemical Technologies I
Nandee	Rajib	155194	Computational Insights Into LLZO and Tantalum-Based Solid-State Electrolytes for High-Efficiency Energy Storage	18-01: Advanced Materials for Sustainability
Nandee	Rajib	155257	Optimizing Borophene and MoS_2 Semiconductors for Low-Cost Clean Energy Production: A DFT Approach	18-01: Advanced Materials for Sustainability
Narsing	Zanil	169550	Technoeconomic Analysis of Transcritical CO_2 Compressor/expander Heat Pump for Industrial Decarbonization	12-02: Process Heat for Industrial Decarbonization
Nicodemus	Julia	169323	Effects of an Annular Baffle on Heat Transfer to an Immersed Coil Heat Exchanger Under Simultaneous Charging and Discharging	19-03: Symposium to Honor Professor Jane Davidson III
Nimmagadda	Lakshmi Amulya	155348	Scalable, Transportable Thermochemical Energy Storage for Decarbonization of Industrial Process Heat	01-01: Decarbonizing Industrial Processes
Nwaiwu	Uchechukwu	157497	Smart, Sustainable Energy Systems for Remote Communities: Leveraging AI, Optimization, and Renewable Integration	11-01: Alternative Energy Converstion Technology (including Wind, Geothermal, Hydro, and Ocean)
Ogunmola	Ifeoluwa	169991	Design Analysis of a Primary Particle Heat Exchanger With a Finned-Wall, Narrow-Channel Fluidized Bed	07-02: Fluidized Bed Heat Exchangers
Ortiz-Ulloa	Juve	169571	Direct-Contact Particle-Based Continuous Discharge Reactors for Thermochemical Energy Storage Coupled to CSP	07-03: Thermal Energy Storage: Phase-Change and Thermochemical
Pal	Ram Kumar	170087	Continuum Modeling of Reduction Reactor-Hot Silo in a Moving-Bed Thermochemical Energy Storage System for Concentrating Solar-Thermal Power (TCES-CSP)	06-02: CSP Receivers and Reactors I
Parker	Walter	166223	Experimental Demonstration of Thermal Desalination and Brine Concentration via Air Gap Diffusion Distillation	12-01: Process Heat for Desalination
Patel	Umang	169609	Pilot Development Progress to Demonstrate Electric Thermal Energy Storage (ETES) Using Low-Cost Particles	04-02: Particles and Materials for Energy Storage
Pei	Yu	169982	Realizing Record-Low Thermal Conductivity and Diffusivity at High Temperatures Using Stable High-Entropy Spinel Oxide Nanoparticles	18-01: Advanced Materials for Sustainability
Punchi Wedikkara	Chathusha	157075	Geometric Optimization of an External Enclosure to Enhance Receiver Thermal Performance	06-03: CSP Receivers and Reactors II
Quinnell	Josh	169975	Low Temperature Thermal Storage: A Researcher's Random Walk Right Back to the Start	19-03: Symposium to Honor Professor Jane Davidson III

LAST NAME	FIRST NAME	PAPER NUMBER	PAPER TITLE	SESSION
Rahman	Areefa	156287	Comparison Between Axial and Radial Flow Packed Bed Reactors for Thermochemical Reactions	09-03: Solar Chemistry III
Ranjan	Durgesh	165503	Indirectly Heated Rector Design for Thermochemical Hydrogen Production	09-02: Solar Chemistry II
Rarick	Andrea	169646	Development of Engineered Biobased Shoe Midsoles for Athletic Performance While Reducing Enviornmental Impacts	17-01: Poster Presentations
Rasset	Evan	156850	The Effect of Pulse Width Modulation of Air-Cooling on Lithium-Ion Battery Thermal Behavior	10-02: Photovoltaic, Photovoltaic-Thermal, and Electrochemical Technologies II
Rincon Duarte	Juan Pablo	156580	Solar Absorptance and Thermal Emittance of Particle Heat Carriers in a Solar Driven Biomass Process	07-01: Experimental Characterization of Particle Flows
Rob	S M Abdur	156667	Optimal Control of Evaporator Fed Through Electronic Expansion Valve for Air Source Heat Pump Systems in Temperate Climates	03-06: Heat Pump Technologies for Sustainable Solutions
Robinson	Olivia	158939	Facilitating Data Collection of Maintenance Events to Populate the Hydrogen Component Reliability Database (HyCReD)	13-02: Hydrogen Production and Storage
Roshanzadeh	Behnam	168370	Efficient and Sustainable Heat and Power Cogeneration Using Evacuated Flat Plate Photovoltaic-Thermal Systems	10-02: Photovoltaic, Photovoltaic-Thermal, and Electrochemical Technologies II
Rozzi	Elena	164841	Multi-Objective Optimization of Renewable Energy Communities: Integrating Hybrid Storage and Life Cycle Assessment for Sustainable Energy Management	03-04: Innovative Energy Storage Solutions for Resilient Communities
Saeidi	Reza	170027	Indoor Air Quality Findings for a Rural Manufactured Home Park in Colorado	17-01: Poster Presentations
Sage	Manuel	156635	The Economic Dispatch of Power-to-Gas Systems With Deep Reinforcement Learning: Tackling the Challenge of Delayed Rewards With Long-Term Energy Storage	02-02: AI for Energy Sustainability II
Sahin	Ibrahim Halil	156757	An Analytical Concentration-Dependent Diffusivity Model for Optimized Sorption Kinetics in Energy and Water Applications.	18-01: Advanced Materials for Sustainability
Saini	Prashant	156388	Numerical Modeling and Size Optimization of Thermal Energy Storage for Iron and Steel Production	04-01: Energy Storage Systems and Applications
Sankrithi	Mithra	169819	Preliminary Design, Modeling & Analysis of a Gigawatt-Scale Cycloturbine Innovation for Offshore Wind Energy	11-01: Alternative Energy Converstion Technology (including Wind, Geothermal, Hydro, and Ocean)
Sattler	Christian	159872	(Invited) Transatlantic Partnership - the Cooperation of Prof. Jane Davidson and Her Group With the German Aerospace Center	19-05: Symposium to Honor Professor Jane Davidson V

Author Index

LAST NAME	FIRST NAME	PAPER NUMBER	PAPER TITLE	SESSION
Scheffe	Jonathan	169901	Unlocking New Routes to Thermochemical H_2 and SO_2 Production via Sulfur Redox Cycling	01-02: Decarbonizing Commodity Chemicals and Emissions Analyses
Schilt	Ueli	158789	Estimating Heat Transfer Coefficients in Residential Buildings Using Real-Life Data	03-03: Building Performance Simulations for Sustainable Solutions
Schroeder	Nathan	169973	High Fidelity Modeling of a Commercial Scale Falling Particle Receiver	06-02: CSP Receivers and Reactors I
Schulke	Gretchen	155769	Survey Design to Enable Analysis of Social Factors Limiting the Expansion of Renewable Energy Technologies	17-01: Poster Presentations
Schulke	Gretchen	168506	Survey Design to Enable Analysis of Social Factors Limiting the Expansion of Renewable Energy Technologies	17-01: Poster Presentations
Scott	Peter	169633	Modeling and Early-Stage Prototyping of an Indirectly Irradiated Multi-Tubular Reactor for Thermochemical Hydrogen Production	09-02: Solar Chemistry II
Scott	Peter	169644	Comprehensive Multiphysics Model for Full-Cycle Analysis of Thermochemical Hydrogen Production Redox Reactors	09-03: Solar Chemistry III
Shafquat	Safwan	157815	Performance Enhancement of a Pressurized Fluidized Bed Gasifier Through Exhaust Gas Recirculation	13-04: Alternative Fuel Production and Utilization II
Shah	Munjal	157798	Hydrogen Dispersion Modeling for Development of Smart Distributed Monitoring	13-01: Hydrogen and Fuel Cells
Shah	Munjal	163967	Prototype Modeling for a Light-Trapping Planar-Cavity Enclosed Particle Solar Receiver	06-04: CSP Receivers and Reactors III
Sharp	M. Keith	155053	Similitude for Buildings Conditioned Exclusively by Ambient Energy	03-01: Advances in Indoor Environment Technologies and Solutions
Sharp	M. Keith	155304	Ambient Energy for Buildings: Opportunities for National Energy and Climate Strategy	19-03: Symposium to Honor Professor Jane Davidson III
Sherif	S.A.	170098	Professor Jane Davidson's Impact on Solar and Renewable Energy and Academic Publishing	19-05: Symposium to Honor Professor Jane Davidson V
Silcox	Rachel	169838	Modeling and Experimental Validation of a Ridged Flow Cell Design for Reduction of Mass Transport Limitation in a Ph-Shifting Electrochemical Device for Oceanic CO_2 Removal	01-02: Decarbonizing Commodity Chemicals and Emissions Analyses
Simoes-Moreira	Jose R.	169890	Indoor Solar Simulator for Producing Solar Fuels	17-01: Poster Presentations
Simoes-Moreira	Jose R.	169894	A Novel Desalinization Device Based on Solar Energy	12-01: Process Heat for Desalination
Smajila	Luka	156628	Potential of Battery Energy Storage Systems for Energy Communities: A Policy-Focused Framework for an Affordable and Sustainable Energy Transition	03-04: Innovative Energy Storage Solutions for Resilient Communities

LAST NAME	FIRST NAME	PAPER NUMBER	PAPER TITLE	SESSION
Smajila	Luka	156786	Bridging the Gap Between Techno-Economic and Environmental: Towards an Integrated Modeling Tool for Battery Energy Storage Systems	10-01: Photovoltaic, Photovoltaic-Thermal, and Electrochemical Technologies I
Sment	Jeremy	170145	Commissioning of the Generation 3 Particle Pilot Plant	08-01: Deployment and Analysis of CSP Subsystems
Sment	Jeremy	170151	Component Downselection for a Particle-Based CSP System	08-01: Deployment and Analysis of CSP Subsystems
Soman	Supriya Mini	155281	Digital Twins for Smart Grid Connected Buildings: A Systematic Literature Review	03-05: Advances in Renewable Energy and Integration
Spieles	Aaron	169985	Particle Flowability Diagnostic Tool and Evaluation of Hopper Performance for Concentrating Solar Power Relevant Temperatures and Granular Media Including Ratios of Entrained Fines	07-01: Experimental Characterization of Particle Flows
Srinivasan	Vinod	169854	Thermal Transport Dynamics in Particle-Laden Suspensions	19-02: Symposium to Honor Professor Jane Davidson II
Stechel	Ellen	169944	Advancements in Solar-Thermochemical Splitting of H_2O and CO_2: Integrating Thermodynamic Modeling With Computational Material Design	19-01: Symposium to Honor Professor Jane Davidson I
Su	Yan	169445	Mesoscale Thermal Energy Transport Through Porous Structures	19-04: Symposium to Honor Professor Jane Davidson IV
Sullivan	Shaun	166045	Thermal Energy Storage and Exchange With Integrated Rotating Media Transport (Sandewirm): An Overview	07-04: Modeling of Thermal Energy Storage and Receiver Systems
Sullivan	Shaun	169962	The Low-Pressure Oxy-Fueled Carbon Capture Power System: A Techno-Economic Overview	14-02: Carbon Capture & Cleaner Fossil Fuel Technologies II
Tenpenny	Joseph	156250	Technoeconomic and Greenhouse Gas Impact Analysis of a Twin-Screw Compressor High Temperature Heat Pump for Spray Drying	12-02: Process Heat for Industrial Decarbonization
Tetreault-Friend	Melanie	169906	Decarbonizing Industrial Processes With Electrified Thermal Energy Storage: Recent Trends	01-01: Decarbonizing Industrial Processes
Tran	Tomy	168490	Integration of Bidirectional EV Charging Into Energyplus to Assess Load Shifting and Economic Benefits of Residential EV Energy Storage	17-01: Poster Presentations
Trimm	Kathryn	169601	Optimization Strategy for the Pressurized Chemical Looping Reforming of Methane Utilizing Nickel-Ceria	09-01: Solar Chemistry I
Van Asselt	Amy	169563	Flattening Utility Demand Through a Low-Cost, Phase-Change-Material Thermal Energy Storage System Design	04-01: Energy Storage Systems and Applications
Venstrom	Luke	156619	Low-Cost Thermally Enhanced Board to Mitigate Hot Spots in Large Scale Concentrated Solar Receivers	19-02: Symposium to Honor Professor Jane Davidson II

Author Index

LAST NAME	FIRST NAME	PAPER NUMBER	PAPER TITLE	SESSION
Verma	Shomik	168670	Thermophotovoltaics Powered by Hydrogen Combustion for Clean, Cheap, and Reliable Electricity	10-02: Photovoltaic, Photovoltaic-Thermal, and Electrochemical Technologies II
Verma	Shomik	168673	High-Absorptance, Thermally-Robust Surfaces for Receivers	06-03: CSP Receivers and Reactors II
Villavicencio	Fernando	169841	Modeling and Flow Cell Measurements for Electrochemical Nitrate-to-Ammonia Conversion	01-02: Decarbonizing Commodity Chemicals and Emissions Analyses
Walker	Howard	167451	Interesting Solar System Simulations in 1990 and 2025	19-04: Symposium to Honor Professor Jane Davidson IV
Wan	Gang	157733	When Free Radicals Meet Solids, Ions, Gases in Photocatalytic Methane Oxidation	09-01: Solar Chemistry I
Wang	Qian	151714	Study on the Integrated System and Characteristics of Desalination and Air Conditioning Based on Evaporative Condensation	12-01: Process Heat for Desalination
Wang	Runsen	162806	Experimental Demonstration and Economic Analysis of an Electrochemical Oxygen Pump Assisted Solar Thermochemical Reactor for CO_2 Reduction	09-04: Solar Chemistry IV
Wasti	Amogh	156089	Feasibility Study of a Ground Sourced Thermoelectric Heat Pump Fitted in Single Family Detached Homes in Different Climate Zones of New York State	03-06: Heat Pump Technologies for Sustainable Solutions
Wei	Xinsheng	170013	Experimental Characterization of Local and Average Heat Transfer Coefficients Up to 700°C in Gravity-Driven Dense Granular Flow	07-01: Experimental Characterization of Particle Flows
Wu	Ziyao	169476	Impact of Hydrogen Separation and Redox Materials on STCH System Efficiency	09-04: Solar Chemistry IV
Xu	Ben	157909	Thermal Insulation Design of Particle-Based Csp Storage Silos Using 1-D Transient Model: A Case Study for a Laboratory-Scale Thermochemical Storage System	07-03: Thermal Energy Storage: Phase-Change and Thermochemical
Yu	Yongjun	156332	A Study on the Load Analysis and Specific Power Improvement of Fuel-Cell Thermal Management System by Evaporative Cooling	13-01: Hydrogen and Fuel Cells
Zare Malek Abad	Mahdi	156869	Simulation of a Latent Heat Thermal Energy Storage System With a Supercritical Carbon Dioxide Working Fluid in a Concentric Borehole Tube for Solar Power Plants	07-03: Thermal Energy Storage: Phase-Change and Thermochemical
Zawacki	Alexander	164468	Experimental Validation of Solar Panel Tilt Optimization and Microclimate Variations of Solar Prairies	02-02: AI for Energy Sustainability II
Zolan	Alexander	169810	Optimizing Design and Dispatch of a Microgrid With Heterogeneous Heating Loads and Air Source Heat Pumps	03-05: Advances in Renewable Energy and Integration

GOLD SPONSOR

CARRIER

Carrier Global Corporation, global leader in intelligent climate and energy solutions, is committed to creating solutions that matter for people and our planet for generations to come. From the beginning, we've led in inventing new technologies and entirely new industries. Today, we continue to lead because we have a world-class, diverse workforce that puts the customer at the center of everything we do. For more information, visit corporate.carrier.com or follow Carrier on social media at @Carrier.

SILVER SPONSOR

AMBA

AMBA makes insurance products available through the ASME Insurance Program such as group AD&D, group life insurance, long-term care insurance, short-term medical, disability insurance, as well as professional liability insurance. AMBA is a national affinity-based insurance agency focused on providing benefits to ASME members.

Carrier Corporation and Amba will be exhibiting in the Westminster Ballroom Foyer, First Floor, Tuesday–Thursday from 10:00AM to 4:00PM. Please stop by and chat with them. Their support helps us keep this conference sustainable!

WE THANK OUR SPONSORS FOR THEIR GENEROUS SUPPORT!

INSPIRING CONFIDENCE
THROUGH SUSTAINABLE SOLUTIONS

As a global leader in intelligent climate and energy solutions, Carrier develops innovative products and digitally enabled services that help customers reduce greenhouse gas emissions and achieve their sustainability goals.

Carrier®

corporate.carrier.com

Explore insurance options built for ASME members:

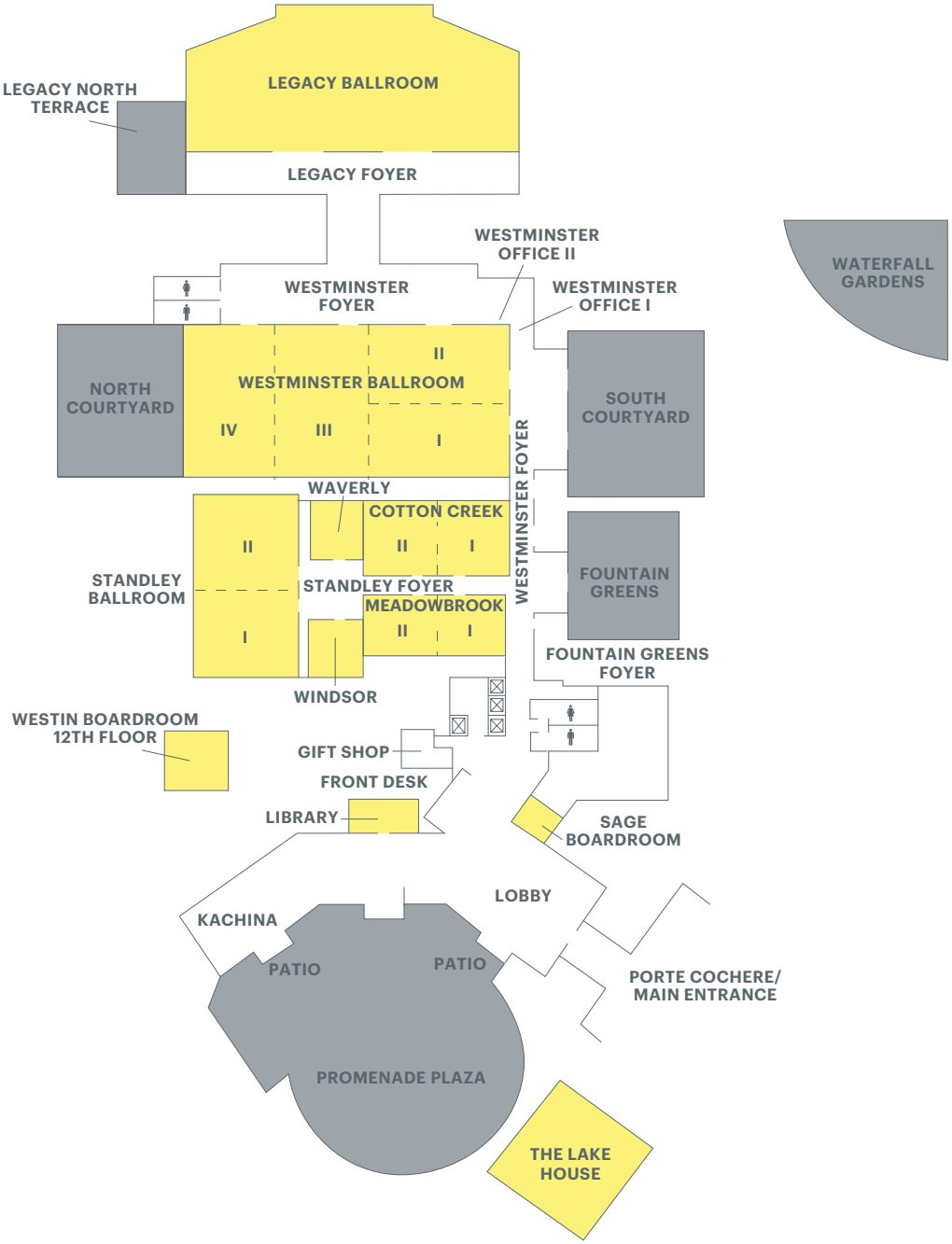
- Group Term Life
- Group 10 and 20-Year Term Life
- Long-Term Care
- Group Accidental Death & Dismemberment
- Home & Auto
- Group Disability Income
- Travel
- Pet
- Short Term Recovery
- Professional Liability
- Business Owners/Workers Compensation
- Cyber Liability
- LifeLock
- Vision

Call 1-800-289-ASME (2763) or visit asmeinsurance.com.

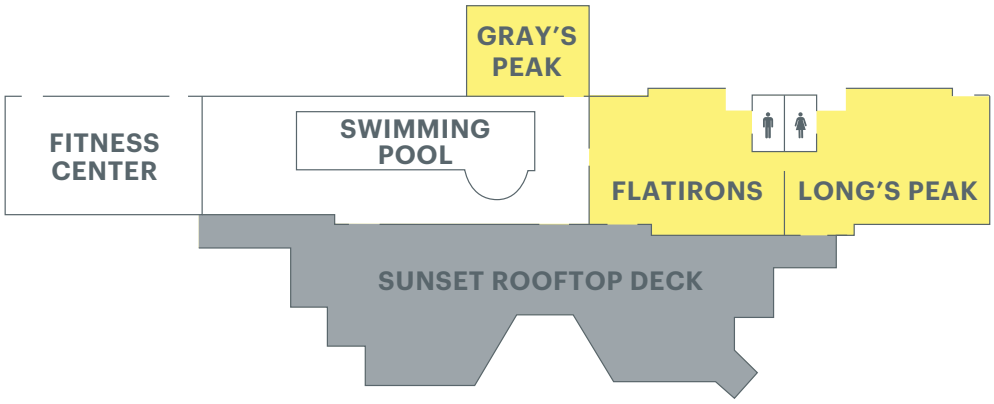
SCAN ME

Hotel Floor Plans

FIRST FLOOR



SECOND FLOOR



ES 2025 Organizing Committee

GENERAL CONFERENCE CHAIRS

Rohini Bala Chandran, Ph.D.
Assistant Professor of Mechanical Engineering
University of Michigan

Dr. Rohini Bala Chandran is an Assistant Professor in Mechanical Engineering at the University of Michigan since January 2018. Previously, she was a postdoctoral research fellow at Lawrence Berkeley National Lab and obtained an M.S. (2010) and Ph.D. (2015) from the University of Minnesota, Twin Cities, in Mechanical Engineering. At Michigan, Prof. Bala Chandran leads the Transport and Reaction Engineering for Sustainable Energy Lab (TREE Lab) to pursue multidisciplinary research in the areas of thermal, fluids and chemical sciences. Dr. Bala Chandran is a recipient of the Bergles-Rohsenow Young Investigator Award in Heat Transfer (2023), NSF-CAREER award (2022), Doctoral New Investigator award from the American Chemical Society Petroleum Research Fund (2021), and one of 100 selected attendees at the US Frontiers of Engineering meeting organized by the National Academy of Engineering (2020).

Pei Dong, Ph.D.
Associate Professor of Mechanical Engineering
George Mason University

Pei Dong is an associate professor in the Department of Mechanical Engineering. She obtained her B.S. in Microelectronics from Nankai University and her Ph.D. in Mechanical Engineering from Rice University. She then did her postdoctoral research in the Department of Materials Science and NanoEngineering at Rice University before joining George Mason University. She is the recipient of the Franz and Frances Brotzen Fellowship Award, Best Thesis Award, Materials Today Energy Promising Early Career Scientists Award, NSF CAREER Award, College of Engineering Computing Faculty Excellence Award, and ASME Rising Star of Mechanical Engineering. Her current research interests include the design and synthesis of advanced materials, device fabrication, and system integration in the areas of energy, water, and biomedical applications.

TECHNICAL PROGRAM CHAIRS

Like Li, Ph.D.
Associate Professor of Mechanical Engineering
University of Central Florida

Dr. Like Li is an Associate Professor in the Mechanical and Aerospace Engineering Department at the University of Central Florida. He was an Associate Professor and Assistant Professor at Mississippi State University (2017–2023). He leads the Thermal Energy Storage and Decarbonization (TESD) Lab focusing on advanced energy storage technologies research, development and demonstration (R&DD) to contribute to the transition to a clean and decarbonized energy future. His group has received funding from federal agencies and industries including the NSF, DOE Solar Energy Technologies Office, NASA, Army Research Laboratory, and Tennessee Valley Authority (TVA). The current research in his group focuses on gas-solid reactions and thermal/chemical transport in materials and reactors, and thermochemical reactors design, development, and demonstration for solar and other renewable energy storage and utilization.

Hailei Wang, Ph.D.
Assistant Professor of Mechanical Engineering
Utah State University

Dr. Hailei Wang is an Assistant Professor in the Mechanical and Aerospace Engineering Department at Utah State University and the Director of the Energy Technology Research & Innovation (eTRI) Lab. He has broad research expertise in heat transfer and advanced energy system modeling. His work has been funded by various agencies including the NRC, DOD, and various DOE offices such as Office of Nuclear Energy, Solar Energy Technology Office, ARPA-E, Building Technology Office and Hydrogen and Fuel Cell Program. His energy system research and thermal modeling work had also been supported by various corporations including Cummins, Medtronic, Thermo Fisher and NuScale Power. He has published over 60 journal and conference papers, and holds three granted patents and multiple patent applications.

TECHNICAL PROGRAM CO-CHAIRS

Shuang Cui, Ph.D.
Assistant Professor of Mechanical Engineering
University of Texas at Dallas

Dr. Shuang Cui currently is an assistant professor in the Department of Mechanical Engineering at the University of Texas at Dallas and also a joint faculty in the Buildings and Thermal Sciences Center at National Renewable Energy Laboratory (NREL). Prior to that, Dr. Cui was a research scientist at NREL. She received her Ph.D. in Mechanical Engineering at the University of California, San Diego. Her research focuses on sustainable energy and water solutions in critical domains, including advanced thermal energy storage for smart buildings and industrial decarbonization, intelligent and sustainable materials and structures for clean water and energy, and nanoscale heat transfer and energy conversion. Dr. Cui received the Best Reviewer Award from American Society of Thermal and Fluids Engineers and President's Award for Exceptional Performance from NREL. She is also highlighted by the Department of Energy's (DOE) "Women @ Energy: STEM Rising" and has been a invited participant of the Rising Stars Women in Engineering Workshop at Seoul National University (Korea).

Aggrey Mwesigye, Ph.D.
Assistant Professor of Mechanical and Manufacturing Engineering
University of Calgary

Aggrey Mwesigye is an Assistant Professor in the Department of Mechanical and Manufacturing Engineering in the Schulich School of Engineering at the University of Calgary. He obtained his B.Sc. degree in Mechanical Engineering from Makerere University, an M.Sc. degree in Mechanical Engineering from the Royal Institute of Technology and a Ph.D. in Mechanical Engineering from the University of Pretoria. His research focuses on the design, modelling, and optimization of advanced sustainable thermal energy systems, including concentrating solar thermal energy systems, thermal energy storage systems, solar-assisted heat pump systems, and advanced refrigeration systems. He has published over 90 journal articles and conference papers and holds 1 patent. He received the Applied Energy Award for the highly cited paper in 2020 and a Best Paper award at the 9th Thermal and Fluids Engineering Conference of the American Society of Thermal and Fluids Engineers. Dr. Mwesigye is a registered Professional Engineer with Professional Engineers Ontario and the Association of Professional Engineers and Geoscientists of Alberta.

Andrew J. Schraderr, Ph.D.
Assistant Professor of Mechanical and Aerospace Engineering
University of Dayton

Dr. Andrew J. Schrader has been an Assistant Professor in Mechanical Engineering at the University of Dayton since January 2020. He was a postdoctoral research fellow, obtained a M.S. (2017), and Ph.D. (2019) from the Georgia Institute of Technology in Mechanical Engineering. At Dayton, he is the director of the Dayton Thermal Applications (DaTA) laboratory with Dr. Rydge Mulford and is the founder of the University of Dayton Supercritical CO_2 Interdisciplinary Research Center. His active research areas include the storage of process heat using particulate ceramics and thermochemically active materials, the development and optimization of sCO_2 power cycles, the thermal management of aerospace vehicles, and novel applications of solar process heat. Dr. Schrader is a recipient of the Valparaiso University Alumni Association First Decade Achievement Award (2024) for his contributions to research and mentoring of future engineers and scientists.

Sarvenaz Sobhansarbandi, Ph.D.
Assistant Professor of Mechanical Engineering
California State University, Sacramento

Dr. Sarvenaz Sobhansarbandi is an assistant professor of mechanical engineering and director of Advanced Renewable/Thermal Energy (ART-E) laboratory at California State University, Sacramento. She received her Ph.D. in Mechanical Engineering from University of Texas at Dallas in 2017. Her research interests include renewable energy, solar energy, computational fluid dynamics/hybrid numerical modeling with the focus on thermal and energy analysis, and design/optimization of thermal management systems. Dr. Sobhansarbandi has gained several years of research experience in the broad area of Thermo-Fluids, particularly solar energy technology, thermal energy storage and nanomaterials. She had exposure to design/modeling of technical issues both by simulation and in real field-testing. Dr. Sobhansarbandi has served as the PI on multiple funded projects from the federal and national organizations such as U.S. Department of Transportation (DOT).

2025 ASME Officers

2025 ASME OFFICERS

President	**Lester K. Su, Ph.D.**
Executive Director/CEO	**Thomas Costabile, P.E.**

ASME STAFF

Colleen Seaver
Manager, Events Management

Evgenia Safina
Meetings Coordinator, Events Management

ChelsaCheyenne Lewis-Bevel
Web Specialist, Conference E–Tools

Jamie Hart
Sr. Manager, Tech & Engineering Communities (TEC)

Mary Grace Stefanchik
Director, Publishing Development

Mary Rose MacDonald
Publishing Coordinator, Conf. Publications

Thank you for
participating in ES 2025.

We hope to see you
again next year at
ES 2026!