Conference Program

ASTFE

10TH THERMAL AND FLUIDS ENGINEERING CONFERENCE (HYBRID)

March 9-12, 2025

www.astfe.org/tfec2025/

Preface

The American Society of Thermal and Fluids Engineers (ASTFE), TFEC2025 Conference (Hybrid) will be held on March 9-12, 2025 partially online virtual and in person at George Washington University, Washington, DC, USA. ASTFE is the premier international society by and for professionals within the thermal and fluids science and engineering community. The 10th ASTFE conference, TFEC2025 provides an international forum for the dissemination of the latest research and knowledge in the thermal and fluid sciences. Authors are invited to submit abstracts covering, but not limited to, the following areas:

Track 1: Thermal Science

- TS: Aerospace Applications
- TS: Heat Pipes
- TS: Innovations in Heat Exchangers
- TS: Combustion, Fire and Fuels
- TS: Electronics Cooling
- TS: Heat Transfer in Multiphase Flows
- TS: Flow and Heat Transfer in Materials Processing Science and Manufacturing
- TS: Heat/Mass Transfer Enhancement Techniques
- TS: Material Issues, Ceramics, Low Thermal Conductivity
- TS: Radiation Heat Transfer
- TS: Inverse Problems and Parameter Estimation in Heat Transfer

Track 2: Fluid Dynamics

- FD: Atomization
- FD: Flow Instability
- FD: Rheology of Nonlinear Materials and Complex Fluids
- FD: Measurement and Modeling of Environmental Flows
- FD: Multiphase Flows
- FD: Nano and Micro Fluids Applications
- FD: Turbulent Flows
- FD: Aerodynamic Design and Analysis
- FD: Turbomachinery
- FD: Thin Film Fluid Phenomena

Track 3: Interdisiplinary Studies

- ID: Experimental Methods/Tools in Fluid Mechanics and Heat/Mass Transfer
- ID: Computational Methods/Tools in Thermal-Fluid Systems
- ID: Machine Learning and Artificial Intelligence in Thermo-Fluid Engineering
- ID: Fundamentals in Fluid Flow and Heat/Mass Transfer
- ID: Flow and Heat Transfer in Biological Systems
- ID: Fluid Flow and Heat Transfer in Industrial and Commercial Processes
- ID: Electric, Magnetic, Flow and Thermal Phenomena in Micro and Nano-Scale Systems

Track 4: Energy and Sustainability

- ES: Carbon Capture and Sequestrations
- ES: Heat Pumps and Innovative Cooling and Heating Systems
- ES: Sustainable Buildings and Cities
- ES: Alternative Energy Conversion Systems (Wind, Biomass, etc.)
- ES: Energy Storage Systems
- ES: Hydrogen Energy Systems
- ES: Solar Energy Equipment and Processes
- ES: Innovative Refrigeration Systems
- ES: Nuclear Energy Systems
- ES: Energy-Water-Food Nexus
- ES: Novel Thermodynamic Cycles
- ES: Thermal management of Energy Systems

Track 5: Educations and Ethics

- EE: Advanements in Thermo-Fluids Education
- EE: Ethics in Thermo-Fluid Engineering
- EE: Innovations in Capstone Projects

Track 6: Competitions and Special Conference Program Elements

- ASTFE Green Energy CFD Competition
- Students Poster Session
- Students Projects: IRES

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About ASTFE

The American Society of Thermal and Fluids Engineers **(ASTFE)** was established in July 2014 to promote the science and applications of thermal and fluids engineering and related disciplines.

ASTFE aims at providing opportunities to promote the dissemination of information and knowledge regarding thermal and fluids engineering, both nationally and internationally. It aligns itself with globally collaborative activities in the traditional areas of heat transfer and fluids engineering, as well as, in emerging areas such as those related to energy, environmental sustainability, manufacturing, thermal management, and micro- and nano-scale transport phenomena.

ASTFE encourages the personal and professional development of young scientists and engineers, and promotes cooperation with other engineering and technical societies to enhance interactions with industry, government agencies and the public at large. Of particular interest to the Society is the organization of conferences and workshops that bring together diverse groups in these fields.

American Society of Thermal and Fluids Engineers **(ASTFE)** is the U.S. nonprofit organization based in New York operating on web 2.0 IT platform to arrange professional communications, support conferences and professional communities. The organization is supported by individual contributors, private foundations and other governmental bodies. All contributions and donations are tax deductible. **ASTFE** supports Open Access movement.

News

"Executive Committee" formed by ASTFE

April 2022 — The American Society of Thermal and Fluids Engineers **(ASTFE)** has formed an Executive Committee (EC) to assist in leading the Society forward. Reporting to the **ASTFE** Board of Directors, the EC serves in a significant leadership role and aims to develop innovative approaches to advance thermal and fluid scientist and engineer engagement within the **ASTFE** community. The EC will work with **ASTFE** members to appoint conference organization committees, technical committees, and working groups. EC members will also collaborate with other societies on conferences and workshops and focus on enhancing **ASTFE** membership outreach and communication.

The inaugural members of the EC were nominated by the **ASTFE** Board of Directors and include **Prof. Wilson Chiu** (University of Connecticut), **Prof. Lorenzo Cremaschi** (Auburn University, EC-chair), **Prof. Jon Longtin** (Stony Brook University), **Prof. Nesrin Ozalp** (Illinois State University) and **Prof. Ting Wang** (University of New Orleans).

If you are interested in having more information, or if you would like to get involved with **ASTFE** activities, please contact **Dr. Lorenzo Cremaschi** (email: lorenzo.cremaschi@auburn.edu).

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Thermal Fluids Engineering Award

A Thermal and Fluids Engineering Award has been established to recognize substantial contributions to thermal and fluids engineering. This is the part of the honors bestowed by the society on its members for their contributions.

2025 TFE AWARD WINNER

Ashwani Gupta

Distinguished University Professor,
University of Maryland

For the development of high temperature air combustion technology and other contributions in combustion research that increase energy efficiency and reduce pollution and greenhouse gas emissions.

Early Career Researcher Award

2025 EARLY CAREER RESEARCHER AWARD WINNER

Akanksha Menon

Assistant Professor, Woodruff School of Mechanical Engineering,
Georgia Institute of Technology

For outstanding contributions to the fields of thermal-fluid sciences, functional materials, and renewable energy to develop decarbonized and efficient technologies for clean energy and water.

ASTFE Fellowship

2025 ELECTED ASTFE FELLOWS

Stathis Michaelidis

Texas Christian University

Hongbin Ma

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Qiuwang Wang

Xi'an Jiaotong University

Pratap Vanka

University of Illinois
Urbana-Champaign

Plenary Speakers

RAVI PRASHER

Affiliation: Bloom Energy

Title: Co-Optimization of Ion and Heat Transport for Efficient Energy Conversion

Abstract: Efficient energy conversion such as chemical-to-electrical energy or heat pumping is critical to tackle climate change. In this talk I will discuss how co-optimization of ions and heat transport can lead to significant advancement in energy conversion technologies such as high temperature solid oxide fuel cell/electrolyzer or air conditioning/heat pumping. Examples will include recent advancement in high temperature solid oxide electrolyzer for hydrogen production, carbon capture from high temperature fuel cells and recently invented Isocaloric refrigeration cycle.

Bio: Ravi Prasher is the Chief Technology Officer of Bloom Energy. He also serves as an adjunct professor in the Department of Mechanical Engineering at UC Berkeley. Prior to joining Bloom Energy, Ravi was the Associate Lab Director of Energy Technology Area at Lawrence Berkeley National Laboratory (LBNL). His responsibilities included managing research and development in a wide variety of areas, including fuel cells, hydrogen production, storage and transport, electrochemical and thermal storage, carbon capture, microgrids, and renewable energy among others. He was also a Senior Scientist at LBNL where he conducted research in thermal science and engineering. Ravi's experience includes being one of the first program directors at US DOE's high-risk high-reward funding agency, ARPA-E, and serving as the technology development manager of Intel's thermal management group. Ravi has published 150+ archival papers in top science and engineering journals and holds more than 35 patents. He is a member of the US National Academy of Engineering and a fellow of ASME. Ravi obtained his B.Tech. from IIT Delhi and PhD from Arizona State University.

Monday — March 10, 2025
8:30 AM - 9:30 AM

GWU Student Center, 3rd floor, Grand Ballroom

RAJAT MITTAL

Affiliation: Johns Hopkins University

Title: From Wave-Powered Propulsion to Flight with Membrane Wings: Insights Powered by High-Fidelity Immersed Boundary Methods based FSI Simulations

Abstract: The perpetual advancement in computational capabilities, coupled with the continuous evolution of software tools and numerical algorithms, is creating novel avenues for research, exploration, and application at the nexus of computational fluid and structural mechanics. Fish leverage their remarkably flexible bodies and fins to harness energy from vortices, propelling themselves with an elegance and efficiency that captivates engineers. Bats fly with unparalleled agility and speed by using their flexible membrane wings. Wave-assisted propulsion (WAP) systems, utilizing elastically mounted hydrofoils, convert wave energy into thrust. Each of these problems involve a complex and elegant interplay between fluid dynamics and structural mechanics. Historically, investigations into such phenomena were constrained by available tools, but modern computational advancements now facilitate exploration of these multi-physics challenges with an unprecedented level of fidelity, precision, and realism. In my presentation, I will discuss projects that harness the capabilities of high-fidelity sharp-interface immersed boundary methods to address a spectrum of challenging problems in engineering and biology involving fluid-structure interaction.

Bio: Rajat Mittal is a fluid dynamicist and a professor of mechanical engineering at Johns Hopkins University (JHU) with a secondary appointment in the School of Medicine. Mittal earned his bachelor's degree in Aeronautical Engineering from the Indian Institute of Technology, Kanpur, in 1989. He then pursued a MS in Aerospace Engineering from the University of Florida, graduating in 1991, followed by a Ph.D. in Applied Mechanics from the University of Illinois at Urbana-Champaign in 1995. Mittal's academic journey includes postdoctoral research at the Center for Turbulence Research at Stanford University from 1995-1996, where he focused on large-eddy simulation. He began his teaching career at the University of Florida's in 1996 and from 2001 to 2009, he was a faculty member at George Washington University. Since 2009, he has been a professor at Johns Hopkins University. Mittal is recognized for his seminal contributions in immersed boundary methods and their applications in fluid flow problems. His research group focuses on computational fluid dynamics, vortex dominated flows, biofluid mechanics, bioinspired engineering, and flow control. His research has made significant impact in fluid-structure interaction, cardiology, bio-locomotion, bioacoustics, COVID biophysics, gastric digestion, active flow control, and turbulent flows. He is the recipient of the 1996 Francois Frenkiel and the 2022 Stanley Corrsin Awards from the Division of Fluid Dynamics of the American Physical Society (APS), and the 2006 Lewis Moody as well as 2021 Freeman Scholar Awards from the American Society of Mechanical Engineers (ASME). He is a Fellow of ASME and the APS, and an Associate Fellow of the American Institute of Aeronautics and Astronautics. He is an associate editor of several journals including the Journal of Computational Physics and Physics of Fluids.

Tuesday — March 11, 2025
8:15 AM - 9:15 AM

GWU Student Center, 3rd floor, Grand Ballroom

VISHWANATH PRASAD

Affiliation: University of North Texas

Title: Supercritical Fluids: An Enigma

Abstract: Cagniard de la Tour discovered the disappearance of the interface between the liquid and vapor at a certain pressure and temperature, in 1822. This was later confirmed by Faraday (1845) and named by Andrews as the "critical point" in 1869. van der Waals, in 1873, parameterized the Andrew's data using a cubic equation of state, and claimed the existence of singularity in the fluid density at CP. This was the beginning of the knowledge of anomaly at the critical point. In 1882, Hannay pointed out that the "continuity hypothesis" was inconsistent with the experimental results of Andrews. Michels dispelled the doubts on actual existence of the critical point in 1937. Widom, in 1963, showed that some of the fluid properties, including specific heat, exhibit maxima at the critical point. Consequently, the critical point was shown as the end point of the liquid-vapor curve on the phase diagram.

In the beginning of this century, Nishikawa observed that inhomogeneity is the most fundamental concept of the SC fluids, which gives rise to a ridge on the phase diagram. This ridge separates the SC region in two parts: SC "liquid-like" (SCLL) and SC "gas-like" (SCGL) states. The existence of these two states has been verified by many researchers, both experimentally and theoretically; obviously, the SC fluids do not have a homogenous single phase. Subsequently, Widom line based on the maxima of the specific heat was proposed to divide the SCLL and SCGL states. It was widely accepted that there exists an anomalous region in the vicinity of critical point that is characterized by large-scale variations in fluid properties, including the inversions. The anomalous region is prone to flow oscillations, thermal instabilities, and deteriorated heat transfer. Interestingly, the research on anomalies in fluid properties were focused on the states beyond the critical point, but not on the subcritical side.

Our team has demonstrated that the subcritical liquid should also be divided into two parts: (a) one the "regular liquid" and (b) the other where the liquid properties are anomalous and may exhibit similar behavior as the SCLL. Apparently, the second state of the subcritical liquid and the first state of the SC fluid (liquid-like) ought to be continuous. Consequently, a hypothetical modification to the phase diagram was proposed. Recently, the anomalous region has been successfully delimited by employing a Gibbs free energy (g)-based thermodynamic model that takes a unified approach from the subcritical to supercritical state. This model gives an expanded thermodynamic definition of the critical point. It is a state, where the third derivative of Gibbs free energy is zero, i.e., $g = 0$, the anomaly in fluid's behavior is maximal, and the governing parameters, c_p^* (= c_p/T), β^* (= $v\beta$), and κ^* (= $v\kappa$) approach infinity. Beyond the anomalous states, the thermophysical properties of SC fluids behave monotonically.

However, the behavior of fluids at high SC pressures and temperatures is still unknown, and hence, the mystery surrounding the supercritical fluids persists. It is expected that many new characteristics of the fluids would be revealed if we can analyze the properties far away from the critical point. Indeed, this knowledge would have a profound impact on our understanding of many terrestrial and extra-terrestrial natural phenomena.

With regard to scientific and technological applications of supercritical fluids, they are being extensively used in chemical, pharmaceutical, food, and materials processing industries, owing to their high solubility at SC conditions. Significant research are also underway in the areas of supercritical heat exchangers, nuclear/fossil fuel thermal power plants, and CO2 energy conversion systems. However, SC fluids have far more potential for their applications in ultra-high-capacity, energy-efficient, and environmentally less-unfriendly thermal systems and pipeline transport of fluids. Many of the above physical, thermodynamic, transport, and application aspects of SC fluids will be elaborated during the presentation.

Bio: Dr. Vish Prasad is the Professor of Mechanical Engineering at University of North Texas. His research includes the broad areas of supercritical fluids, convective heat transfer, heat transfer in porous media, energy systems, advanced materials processing and manufacturing, and computational methods. Dr. Prasad has published over two hundred twenty-five invited and/or refereed articles and made over two hundred conference/seminar presentations. He has served on many Editorial Advisory Boards, as an Editor or Co-editor of several archival journals and monographs, and a Co-Editor of the Springer Handbook of Crystal Growth. Currently, he is the Editor-in-Chief of the SpringerNature Mechanical Engineering Series and the Annual Review of Heat Transfer. Dr. Prasad is a member of the Board of Directors of ASTFE and a Fellow of ASME and ASTFE.

Dr. Prasad has received 2020 Heat Transfer Memorial Award from ASME, 2011 Michael P. Malone International Leadership Award from the Association of Public and Land-Grant Universities (APLU), 2010 Award for building Texas-India Educational Partnership from the Greater Dallas Indo-American Chambers of Commerce, 2007 Educator of the Year Award from Great Minds in STEM, a national Hispanic organization, and 2006 Academic Excellence Medal from the Latin American and Caribbean Consortium of Engineering Institutions.

Dr. Prasad's previous academic positions include Assistant and Associate Professor at Columbia University, Leading Professor/Professor at Stony Brook University, Distinguished Professor at Florida International University, and Visiting Distinguished Professor at Indian Institute of Technology, Kanpur. In addition, he has served in many academic leadership roles, including the President of Mody University of Science and Technology (India), Vice President for Research and Economic Development of University of North Texas, Executive Dean/Dean of Engineering and Computing of Florida International University, Interim Dean of Engineering at Wichita State University, and Associate Dean of Engineering (Research and Graduate Studies) at Stony Brook University.

Wednesday — March 12, 2025
8:15 AM - 9:15 AM

GWU Student Center, 3rd floor, Grand Ballroom

Keynote Speakers

ZHITING TIAN

Affiliation: Cornell Engineering

Title: Understanding Thermal Transport for Electronics, Energy, Quantum, and Space Applications

Abstract: Thermal phonons are the major heat carriers in dielectrics and semiconductors. A solid understanding of thermal transport is crucial to controlling heat flow and engineering material with desired thermal properties. My group integrates cutting-edge modeling and experimental approaches to understand thermal phonon transport in semiconductors, hybrid organic-inorganic materials, and polymers. More specifically, we have been developing ab initio atomistic modeling tools, creating new thermal metrology, advancing X-ray and laser-based measurements, and building synthesis capabilities. In this talk, I will present our progress in studying thermal phonon transport for microelectronics cooling, thermoelectric energy conversion, quantum computing, and space exploration.

Bio: Dr. Zhiting Tian is an Associate Professor, Eugene A. Leinroth Sesquicentennial Faculty Fellow of the Sibley School of Mechanical and Aerospace Engineering at Cornell University. Zhiting obtained her Ph.D. in Mechanical Engineering at MIT in 2014. Her recent awards and honors include ASME Fellow, DARPA Young Faculty Award, NASA Early Stage Innovations Award, Air Force of Scientific Research (AFOSR) Young Investigator Award, Office of Naval Research (ONR) Young Investigator Award, and National Science Foundation (NSF) CAREER Award.

Monday — March 10, 2025
2:15 PM - 3:00 PM

GWU Student Center, 1st floor, Betts Theater

GUANGDONG ZHU

Affiliation: NREL

Title: Emerging Technologies for Future Energy Challenges: from Concentrating Solar Power, Seasonal Storage, to Hybrid Energy Systems

Abstract: There is an increasing energy demand for meeting the economy growth and emerging high-tech technology advancement such as data centers. It requires us to explore full potential of all renewable technologies, in addition to improving energy usage efficiency where possible. In this seminar, the speaker will provide an overview of emerging renewable thermal energy technologies, the applications of heat transfer and fluids mechanics in the technologies of concerns, and the strategy in identifying opportunities to get engaged in the upcoming energy challenges.

Two examples in the speaker's journey are given: next generation concentrating solar power (CSP) technologies and geological thermal energy storage (GeoTES) technologies with solar hybridization. CSP, naturally coupled with low-cost thermal energy storage, can offer valuable daily energy dispatching to the grid; GeoTES with solar hybridization has shown a potential to provide a unique low-cost seasonal storage solution without requiring major technical breakthrough.

At the end, the speaker will share his vision on how to integrate academia and industrials to develop a unique platform of hybrid energy systems for research, development, and deployment and grow a world-class program to tackle most critical problems foreseen in the future low-cost and high-resilience energy infrastructure in US.

Bio: Dr. Guangdong Zhu has been a senior researcher since 2010 and, lately, the group manager of Thermal Energy Systems, at the National Renewable Energy Laboratory (NREL). The Thermal Energy Systems group is focused on concentrating solar power technologies, thermal energy storage and renewable energy hybridization. He is also the concentrating solar power (CSP) program lead and overseeing a portfolio of over 40 RD projects at NREL. As a researcher, Guangdong has been leading research efforts related to solar collector development, linear Fresnel technology, seasonal storage, and renewable energy hybridization. He is the executive director of the newly formed 5-year $25M heliostat consortium co-led by NREL and Sandia National Labs, partnering with Australian Solar Thermal Research Institute (ASTRI). He is the associate editor of the ASME Solar Energy Engineering since 2023 and was the ASME Journal of Energy Resources Technology between 2019 - 2022. He has served as technical/general program chair for ASME Energy Sustainability international conference in 2017 - 2020. He won NREL's staff award for outstanding performance in 2021, President's award in 2016 and Outstanding New Partnership Award in 2016. He has published over 40 peer-reviewed journal/conference papers and given invited presentations at various research institutes. Dr. Zhu obtained his Ph.D. in mechanical engineering from the University of New Mexico in 2006.

Monday — March 10, 2025
2:15 PM - 3:00 PM

GWU Student Center, 3rd floor, Grand Ballroom

ERIC LOTH

Affiliation: University of Virginia

Title: Near Isothermal Compressed Air Energy Storage for Wind Turbines

Abstract: Compressed air energy storage (CAES) is a low-cost, long-duration energy storage option which may be important for a fully renewable electrical grid. CAES is especially well suited to address the wind energy intermittency issue since it can store energy for long periods. However, CAES conventionally has poor thermal efficiency, which has prevented significant adoption. One approach to increase the efficiency of CAES is to employ near isothermal compression, where increased heat transfer allows the air to maintain a near-constant temperature during both compression and expansion to maximize round-trip efficiency. Near isothermal conditions can be accomplished with water sprays of micro-scale droplets to increase heat transfer during the compression and expansion processes for piston-based configurations. A new theory and a new non-dimensional number, the Crowe number, have been developed to describe the thermal efficiency of air compression for energy storage and for air expansion for energy regeneration. Complemented with experiments and simulations, the use of micro-scale heat transfer for MW-scale energy storage is explored to evaluate the design space. In addition, it is shown that turbine-integrated CAES can eliminate two of the most expensive components for stand-alone CAES: the electric motor/generator and the pressure vessel. Design space results combined with levelized cost of storage analyses show that turbine-integrated may allow for low-cost energy storage with high round-trip efficiency. However, a range of challenges and issues must be considered to advance the early-stage concept.

Bio: Prof. Eric Loth serves as the Rolls-Royce Commonwealth Professor of Engineering. He has received honors and awards from NASA and the National Science Foundation while also being named a Fellow of the American Society of Mechanical Engineers, of the American Institute of Aeronautics and Astronautics, of the National Center for Supercomputing Applications, and of Cambridge University. Dr. Loth has given invited talks at Cambridge, Penn, Princeton, Oxford, Harvard, and MIT. In 2017, his project team was invited to US Congress to discuss their new the $3.7M project on extreme-scale morphing wind turbines. This ambitious project has received coverage by NBC, Scientific American, Popular Science, Yahoo and MIT Technology Review.

Monday — March 10, 2025
3:00 PM - 3:45 PM

GWU Student Center, 1st floor, Betts Theater

DANIEL PRESTON

Affiliation: Rice University

Title: Mitigating Chemical and Thermal Failures of Engineered Wettability Surfaces

Abstract: Contamination from airborne hydrocarbons profoundly affects surface chemical composition by partially or completely passivating surfaces, in turn impacting phase-change heat transfer performance because the formation of droplets and bubbles is significantly influenced by surface chemistry and wettability. However, contamination remains difficult to manage due to the ubiquitous nature of hydrocarbons and the spontaneity of the adsorption process. We show that contamination even affects fundamental measurements taken during X-ray photoelectron spectroscopy (XPS), within minutes, evidenced with tests conducted in different XPS systems at multiple universities, both with and without pre-cleaning via ion bombardment. To overcome the pervasive issues associated with contamination, we developed a passive clean storage technology that employs a low-cost and scalable high-surface-area clean storage medium as the getter, with its design based on molecular adsorption–desorption competition theory. Experiments show that this strategy maintains a consistent level of surface cleanliness for several weeks—in contrast to common approaches including storage under vacuum and in sealed sample holders—and can even passively clean initially contaminated samples during storage. The proposed strategy represents a promising approach for preservation and transportation of contamination-sensitive samples and will help achieve consistent experimental results for phase-change heat transfer.

Interestingly, phase-change heat transfer itself plays a role in a different mode of failure for superhydrophobic surfaces (i.e., surfaces with an extreme ability to repel water, imparted by a combination of surface texture and chemistry). While superhydrophobic surfaces have garnered interest for their utility in numerous engineering applications, they often lose their repellency when contacted by hot water (> 40 °C), primarily due to irreversible condensation of water vapor within the surface texture. We address this thermal failure mode by introducing a multilayered insulated superhydrophobic (MISH) coating that mitigates condensation by moderating heat transfer. Experiments show that superhydrophobicity is extended to 90 °C with the MISH coating, with durability demonstrated via jet bouncing and long-term droplet impingement experiments. We explain the underlying mechanism enabling improved performance with a detailed thermal model. The MISH coating accommodates curved geometries and large surfaces, and it is over four orders of magnitude less expensive than cleanroom-fabricated alternatives, indicating promise for practical use in the power, food, and medical industries.

Bio: Daniel J. Preston directs the Preston Innovation Laboratory at Rice University conducting research at the intersection of energy, materials, and fluids. He is a recipient of the NSF CAREER Award, the ASME Old Guard Early Career Award, and the Energy Polymer Group Certificate of Excellence. His lab is funded by NASA, the National Science Foundation, and the Department of Energy, among other sources. Dr. Preston earned his B.S. (2012) in mechanical engineering from the University of Alabama and his M.S. (2014) and Ph.D. (2017) in mechanical engineering from MIT. Following his graduate degrees, he trained as a postdoctoral fellow from 2017–2019 at Harvard University in the Department of Chemistry and Chemical Biology prior to joining Rice University in July 2019.

Monday — March 10, 2025
3:00 PM - 3:45 PM

GWU Student Center, 3rd floor, Grand Ballroom

JORGE GONZALEZ-CRUZ

Affiliation: University of Albany

Title: On the Nexus of Climate, Energy and Air Quality in Complex Urban Environments

Abstract: This presentation focuses on cities – a nexus of climate, energy, and air quality. The well-known Urban Heat Island (UHI) effect is the result of surface energy balance changes and anthropogenic heat emissions, largely from buildings, which forms a two-way feedback. In warm seasons, excess heat from the UHI is a major driver of tropospheric ozone production once combined with nitrogen emissions, from transportation or industry, and with volatile organic compounds, from vegetation. Building exhalations are also a major source of environmental emissions, via their ventilation systems. These systems emit Volatile Organic Compounds (VOC) and Volatile Compound products (VPC), which are suspected to be major contributors for ozone production. As such, there is direct positive feedback in warm seasons between extreme heat, energy demands, and sources for ozone production. In cold seasons, this nexus also prevails; cold climates motivate energy demands, which leads to pollutants from the gas or coal driven building heating systems, enhancing the UHI which results in negative feedbacks. We present a unified observation and modeling approach to investigate this nexus in the two end-use cases of New York City and Houston. Observations and modelling from two major summer field campaigns are used to explore ozone episode cases driven by heat waves. The modeling used an urbanized weather model, which incorporates a building energy model, and is coupled to a chemical physical model, referred as a whole as uWRF-Chem. The modeling framework was validated against the wide range of field observations, including satellite and surface stations, and demonstrated that incorporating urban effects is indeed necessary for accurate prediction of meteorological-chemical events. Observations showed a complex spatial and temporal interaction between the surface meteorology, UHI, sea-breeze front, and the ozone peak ridge. Results showed maximum ozone production takes place in the cities. Resulting high concentrations are advected to the urban outskirts, where the sea-breeze collapses and led to ozone peaks. Total energy for the city reached seasonal peaks during these events as well. Building energy use was found to be a key contributor to both UHI intensification and maximum ozone production directly and indirectly. Finally, we explore implications of this nexus in changing in future winters, as cities develop plans towards full electrification of the building sector.

Bio: Prof. González-Cruz is the SUNY Empire Innovation Professor at the University of Albany of Atmospheric and Environmental Sciences, lead scientist of the Coastal-Urban Environmental Research Group (CUERG). Prof. González-Cruz earned his Doctorate (1994) and Bachelor (1988) degrees in Mechanical Engineering from the Georgia Institute of Technology and from the University of Puerto Rico-Mayagüez, respectively. He teaches and conducts research in urban energy sustainability and resiliency, urban weather and climate, and regional climate modeling and analysis. Professor González-Cruz holds several patents in solar energy equipment, solar desalination systems, aerosol detection, and energy forecasting for buildings, and was recognized as a prominent young researcher by the National Science Foundation with a prestigious CAREER Award. He has authored or co-authored more than 100 peer-reviewed publications, has delivered 100s of conference presentations, and his research has attracted more than $50M in external funding. He is a Fellow Member of the American Society of Mechanical Engineering (ASME), and Former Vice-Chairman of the American Meteorological Society (AMS) Board on the Urban Environment. He is the 2025 recipient of the AMS Helmut E. Landsberg Award for Outstanding Contributions to Urban Climate. He was appointed in 2015 by the Mayor of the City as Member of the Climate Change Panel for City of New York, and more recently named Senior Scientist of Brookhaven National Laboratory, and Member of the US Department of Energy Office of Science Scientific Advisory Committee. He is the co-editor of the ASME Handbook of Integrated and Sustainable Buildings Equipment and Systems, and was named in 2019 as the Founding Editor of the newest ASME Journal of Engineering for Sustainable Buildings and Cities.

Tuesday — March 11, 2025
1:00 PM - 1:45 PM

GWU Student Center, 3rd floor, Grand Ballroom

DEBJYOTI BANERJEE

Affiliation: Texas A&M University

Title: nanoFin Effect (nFE)

Abstract: We are leveraging bio/micro/nano-technologies for augmenting bio-sensing, cooling, energy storage and safety systems (involving both experimental and computational studies). The presentation will encompass these topics:

Nano-Coatings (Nano-Fins): Nano-thermocouples and diode temperature nano-sensors integrated with nano-coatings enhanced the non-linear coupling of thermal and hydrodynamic transport during phase change (boiling, condensation) which causes spatio-temporal fluctuations of temperature (boiling chaos and fractal structures) at the micro/ nano-scales. These are called "cold- spots" and transmit over 60-90% of the total heat flux. Nano-coatings enhanced heat flux by 100% in compact condensers. Using silicon nanofins - cooling was enhanced by ~120%. Using Carbon-Nanotube (CNT) nano-coatings - cooling was enhanced by 60~300% by leveraging cold-spots and the "nano-fin effect (nFE)" (i.e., in excess of the enhanced surface area).

Nano-Fluids: Specific heat capacity was enhanced by ~120% for nanofluids., which can be leveraged for Thermal Energy Storage (TES) in Small Modular Reactors (SMR) and Concentrated Solar Power (CSP) using mol-

ten salt nanofluids. Flow of nanofluids in a microchannel showed that the precipitated nanoparticles behaved as nanofins (nFE). nFE dominate heat transfer for micro/nanoscale flows while reducing corrosion by 2~4 times.

Phase-Change Materials (PCM) & Machine Learning (ML): The reliability of PCM was demonstrated for 1000 cycles of repeated melting and solidification using additives (nucleation promoters). ML techniques were deployed for improving reliability of TES platforms that leverage PCMs for mitigating Food-Energy-Water (FEW) nexus. We are extending this work for a solar-desalination platform using swirl-flow flash-evaporation and phase-separation platform. Effectiveness of 3-D Printed Heat Exchangers (TES) was enhanced using PCM and tested successfully for electronics cooling in self-driving electric-cars (student team from TAMU that he mentored won the SAE awards in 2018 and 2024).

Bio: Prof. Banerjee was elected as a Fellow of ASME in 2015 and the Dean's Fellow of EnMED (the Inter-Collegiate School of Engineering Medicine) in 2019. He is an Associate Editor (AE) of the ASME Open Journal of Engineering (AOJE). In the recent past, he has served as an AE and multiple times as Guest Editor (Special Issue) of the ASME Journal of Heat Transfer (JHT), ASME Journal of Energy Resources Technology (JERT) and the ASME Journal of Nanotechnology in Engineering & Medicine (JNEM). He received his Ph.D. in Mechanical Engineering (with minor in MEMS) from the University of California, Los Angeles (UCLA), and the Bachelor of Technology (Honors) in Mechanical Engineering from the Indian Institute of Technology (IIT-Kharagpur). He supervised research of 32 undergraduates (3 honors thesis) and 49 graduate students (21 PhD and 28 MS), yielding more than 300 archival publications. He received 17 US Patents (and 3 US Patents pending) from his prior research work at Applied Biosystems Inc./ ABI (Life Technologies, CA), NanoInk Inc., Ciphergen Biosystems Inc., Coventor Inc., Tata (India) and TAMU. He was selected for "ASEE Summer Faculty Fellowship ('06, '07, '09)" at AFRL (Dayton, OH) and at Space & Naval Warfare Center/ SPAWAR-SSC (San Diego, CA).

Tuesday — March 11, 2025
3:45 PM -4:30 PM

GWU Student Center, 1st floor, Betts Theater

ALI BESKOK

Affiliation: Southern Methodist University

Title: From Atoms to Flow: Exploring Evaporation and Condensation in Nano-Channels

Abstract: In this talk, we present nonequilibrium Molecular Dynamics (MD) simulation results on thin-film evaporation in a nano-pump driven by phase change, using liquid argon confined between parallel platinum plates. Our simulation captures a self-regulating and self-sustaining net flow in a statistically stable steady-state, featuring a thin-film evaporation region near the heater and a one-dimensional condensing interface at the condenser side. We first explore the dynamics of evaporating menisci for different channel heights and provide insights into the underlying flow physics using velocity vectors and temperature contours. Notably, our MD simulations reveal evaporation from the adsorbed layer—a region traditionally considered nonevaporating. This discovery offers a potential explanation for the deviations from theoretical maximum evaporation rates observed in recent experiments. We also compare the MD findings with predictions from continuum-based thin-film evaporation models. Additionally, we examine the temperature profiles and the resulting temperature jumps across the interfacial region under varying heat flux conditions, and investigate their relationship with the energy dynamics of atoms crossing the liquid-vapor interface. Finally, using Lagrangian particle tracking techniques, we assess the validity of the Hertz-Knudsen-Schrage relations and extract mass accommodation coefficients for the steady-state condensing surface. This comprehensive analysis provides new insights into nanoscale phase change dynamics and has implications for enhancing evaporation models.

Bio: Prof. Ali Beskok received his B.S. in Mechanical Engineering from Middle East Technical University, Ankara, Türkiye in 1988. He received an MS degree in Mechanical Engineering from Indiana University Purdue University in Indianapolis in 1991, and M.S. and Ph.D. degrees from Princeton University, Mechanical and Aerospace Engineering in 1994 and 1996, respectively. Beskok was a Visiting Scholar at Brown University, Center for Fluid Mechanics from 1994 to 1996, and a Post-Doctoral Research Associate at Massachusetts Institute of Technology, Research Laboratory of Electronics from 1996-1998. He joined Texas A&M University Mechanical Engineering Department as an Assistant Professor in 1998, and became an Associate Professor in 2004. In 2007, he moved to Old Dominion University, Mechanical and Aerospace Engineering Department as the Batten Endowed Chair Professor of Computational Engineering. He was also the founding director of the ODU Institute of Micro and Nanotechnology. In August 2013, he moved to Southern Methodist University as the chair of the Mechanical Engineering Department and served at this capacity until June 2019. Currently, he is the George R. Brown Chair in Mechanical Engineering, and the Associate Dean for Research Innovation and PhD education in the SMU Lyle School of Engineering.

Tuesda y— March 11, 2025
3:45 PM -4:30 PM

GWU Student Center, 3rd floor, Grand Ballroom

TEC Talk Speakers

TECHNOLOGY I ENTREPRENEURSHIP I COMMUNICATION
FROM IDEA TO TECHNOLOGY TO PRODUCT

LIJIE GRACE ZHANG

Affiliation: George Washington University

Title: Driving Research Excellence and Technology Innovation at GW Engineering and Personal Experience in 4D Bioprinting

Abstract: Dr. Lijie Grace Zhang serves as a Professor and Associate Dean for Research in the School of Engineering and Applied Science at the George Washington University. She is an ASME Fellow, AIMBE Fellow, as well as the director of the Bioengineering Laboratory for Nanomedicine and Tissue Engineering at GW.

In this talk, Dr. Zhang will highlight GW Engineering's advancements in promoting cutting-edge interdisciplinary research, innovation, entrepreneurship, and workforce development. In addition, she will share her personal journey in pioneering 4D bioprinting techniques for biomedical applications and discuss the challenges and opportunities of this emerging technology.

Bio: Professor Lijie Grace Zhang's Bioengineering Laboratory for Nanomedicine and Tissue Engineering applies a range of interdisciplinary technologies and approaches in 3D/4D bioprinting, nanotechnology, tissue engineering, and drug delivery for various biomedical applications. The main ongoing research projects include: developing advanced 3D/4D bioprinting techniques and designing biologically inspired nanostructured scaffolds for complex cardiovascular, neural and musculoskeletal tissue regenerations; investigation of the influence of nano and chemical environments in directing stem cell differentiations for regenerative medicine; developing sustained drug formulations for long term and controlled drug release at disease or cancer sites; developing a novel 3D tunable tissue model for cancer metastasis study; and 4D printing soft biorobotics for biomedical applications.

Tuesday — March 11, 2025
2:30 PM - 3:30 PM

GWU Student Center, 3rd floor, Grand Ballroom

VAN P. CAREY

Affiliation: Berkeley Mechanical Engineering

Title: Strategies to Best Leverage AI and Machine Learning to Create Breakthrough Energy and Thermal Management Technologies

Abstract: Many would agree that AI and machine learning may facilitate quantum-step advances in widely diverse areas of technology. It seems clear that we are at a watershed moment: AI and machine learning development is on a path to drive a burst of technical innovation. However, this talk will argue that making breakthroughs happen requires strategies that blend machine learning capabilities with other key ingredients. This talk will discuss other essential elements of development strategies that can help create ground-breaking machine-learning-enhanced technologies. It will specifically argue that we need to transform how we train engineers and scientists and rethink how we approach technology development to maximize the benefits of AI and machine learning tools. And it will discuss how this is particularly relevant to development of innovative energy conversion and thermal management technologies.

Bio: Professor Carey is widely recognized for his research on near-interface micro- and nanoscale thermophysics and transport in liquid-vapor systems, and computational modeling and simulation of energy conversion and transport processes. His research has frequently included modeling at multiple scales, ranging from the molecular level (molecular dynamics simulation of thermophysics) to the device and system level (multidevice system models). His research is also exploring the use of machine learning strategies to enhance performance of energy conversion and transport in applications, and create energy technologies that can autonomously adapt to maximize their performance and reduce their environmental impact.

Since joining the Berkeley faculty in 1982, Professor Carey's research has spanned a variety of applications areas, including high performance solar thermal power systems, building and vehicle air conditioning, smelting and casting of aluminum, phase change thermal energy storage, heat pipes for aerospace applications, high heat flux cooling of electronics, data center thermal management, and energy efficiency of digital information systems. His research has contributed to developing advanced heat rejection technologies for electronics cooling, building AC systems, and power plants, and he has developed performance models for Tesla turbine expanders for green energy conversion technologies and thermionic power generation technologies for space applications.

Carey's current research emphasizes development of strategies to use

machine learning tools to better understand and model flame spread processes in electronic systems and the physics of boiling heat transfer at surfaces covered with hydrophilic nanostructured coatings. This includes exploring innovative ways to combine advanced instrumentation data and machine learning image analysis to understand the physics of boiling processes. He is also using machine learning tools to enhance performance modeling of energy conversion devices, and developing machine-learning-based adaptive energy conversion systems that can autonomously adjust their operation to simultaneously maximize energy efficiency and meet operating requirements for the application of interest.

Carey is a Fellow of the American Society of Mechanical Engineers (ASME) and the American Association for the Advancement of Science, and he has also served as the Chair of the Heat Transfer Division of ASME. Carey received the James Harry Potter Gold Medal in 2004 for his eminent achievement in thermodynamics, and the Heat Transfer Memorial Award in the Science category (2007) from the ASME. Carey is also a three-time recipient of the Hewlett Packard Research Innovation Award for his research on electronics thermal management and energy efficiency (2008, 2009, and 2010), and he received the 2014 Thermophysics Award from the American Institute of Aeronautics and Astronautics.

Tuesday — March 11, 2025
2:30 PM - 3:30 PM

GWU Student Center, 3rd floor, Grand Ballroom

MARCELO J.S. DE LEMOS

Affiliation: Instituto Tecnologico de Aeronautica

Title: Emerging Thermal Technologies for Plug and Abandonment of Oil Wells

Abstract: The transition from a carbon-based to a carbon-free economy has spurred the development of innovative technologies. Simultaneously, decommissioning old energy production plants and processes requires significant effort due to the environmental damage they leave behind. This is particularly true for oil and gas wells, which have been drilled globally for over a century. Today, strict environmental regulations mandate that unprofitable wells comply with technical standards ensuring that no leaks occur after plug and abandonment (P&A) operations. The environmental risks posed by thousands of active wells, combined with the rising costs of P&A, have driven research into more reliable and cost-effective solutions. One promising method involves using a powerful heat source to melt the casing, tubing, and surrounding cap rock, sealing the well as the molten mass cools. This review explores and discusses novel technologies being developed as well as advanced mathematical modeling, numerical simulations, and experiments that address the complex Multiphysics involved in these thermal processes.

Bio: Prof. de Lemos obtained his Bachelor and MSc degrees in Mechanical Engineering from the Pontifical Catholic University of Rio de Janeiro (PUC-RJ) in 1977 and 1979, respectively. In early 1983, he obtained his PhD degree from Purdue University, USA. He spent a year as Assistant Professor at PUC-RJ in 1984, followed by two years as Resident Associate at Argonne National Laboratory, Illinois. In 1986, he joined the Aeronautical Institute of Technology -ITA in São José dos Campos, Brazil. He is Full Professor at ITA, founder and head of the Computational Transport Phenomena Laboratory -LCFT and the newly established Competence Center for Energy – CCE. He also served as Head of the Department of Energy/IEM/ITA from 03/2012 to 07/2022, Research Area Coordinator at Graduate School/ITA from 08/95 to 07/97 and Head of the former Cooperation Division IEX-C/ITA from 03/2014 to 04/2016. From 1991 to 1992, he was Visiting Scholar at Ruhr-Universität-Bochum, Germany. In early 1992, he became a Member of the American Society of Mechanical Engineers -ASME and in 2009 he was promoted to the "Fellow" grade. He is also a “Fellow” of the Royal Aeronautical Society (UK) and “Associate Fellow” of the AIAA. In 2021 he was awarded the Fulbright Distinguished Chair at Purdue University, USA. He has advised 15 PhD and 32 MSc students. Prof. de Lemos has set a new mathematical framework for novel treatment of turbulent flow, heat, and mass transfer through permeable media. Overall, he has published more than 450 articles in conference proceedings and journals in addition to nine book chapters and five books. Prof. de Lemos´ research interests involve computational thermo-fluid dynamics, transport phenomena, porous media, thermal engineering, aerodynamics, gas turbines, advanced fossil and renewable energy systems (wind, solar, biomass), high performance computing, turbulent reactive flow, computational Mathematics, combustion dynamics, modeling and simulation of thermo-chemical systems, fuel cells, gasification processes and CO2 capture and storage technologies.

Tuesday — March 11, 2025
2:30 PM - 3:30 PM

GWU Student Center, 3rd floor, Grand Ballroom

MICHAEL KEIDAR

Affiliation: George Washington University

Title: Cold Plasma for Medicine

Abstract: WIntense research effort in low-temperature (or cold) atmospheric plasma application in bioengineering led to foundation of a new field, plasma medicine. Cold atmospheric plasmas (CAP) produce chemically reactive species including reactive oxygen species (ROS) and reactive nitrogen species (RNS). These species are known to have biological effects on cells, such as the peroxidation of lipids and proteins. The most recent research area of plasma medicine is the interaction of CAP with cancer cells. It has been demonstrated by several investigators that CAP can induce apoptosis (programmed cell death) in various cancer cell lines. In addition, CAP treatment affects preferentially the cell cycle of cancer cells. This opened up the possibility that CAP could be the basis of a new cancer therapy. The uniqueness of low-temperature plasma is in its ability to change composition in situ. The above-mentioned biomedical applications seem to usher a new transformational approach to healthcare based on CAP technology. Recent efforts culminated in a successful clinical trial. In this presentation a review of the research achievements accomplished in the last decade and translational potential of this technology will be presented.

Bio: Professor Michael Keidar's Micropropulsion and Nanotechnology Lab conducts advanced fundamental and applied research in plasma medicine, micropropulsion for micro and nanosatellites, and plasma nanoscience and nanotechnology. Current projects include a cold plasma application for wound healing; cold plasma cancer therapy; the synthesis of single-wall carbon nanotubes with controlled conductivity; the synthesis of graphene with controlled numbers of layers; and the manufacturing of ultracapacitor devices based on nanotubes and graphene, micro-cathode thrusters for nano satellites, and multi-scale plasma simulations.

Tuesday — March 11, 2025
2:30 PM - 3:30 PM

GWU Student Center, 3rd floor, Grand Ballroom

Call for Abstracts: First Annual ASTFE Green Energy CFD Competition

The 10th annual Thermal and Fluids Engineering Conference (TFEC) meeting at George Washington University, Washington, DC, USA on March 9-12, 2025 will host a competitive event involving CFD simulations of unsteady room ventilation. The aim is to expose the difficulty in benchmarking CFD results due to the influence and confluence of various computational uncertainties. Our procedure will be as outlined below and will mimic a similar competition in 2024. **There will be three prizes, each, for the Graduate-led and Undergraduate-led teams: 1st $1500, 2nd $1000, and 3rd $500 for a total of $6000**.

Lead Organizer: Wayne Strasser, PhD, PE, Libery University

Co-Organizers: Zheng O`Neill, Ph.D., P.E., Texas A&M University; Mingjun Wei, Graduate Research Assistant, Texas A&M University; Yong Tao, Ph.D., P.E., Cleveland State University; Keith Walters, Ph.D., University of Arkansas

Speakers: Amirhosein Sarchami, University of Cincinnati; Abdulrahman Alzailaie, University of Wisconsin-Madisony

Monday — March 10, 2025
11:15 AM - 12:45 PM at session 1H

GWU Student Center, 4th floor, Room 405

Invited Special Talk Speaker

GERARDO MARIA MAURO

Affiliation: Università degli Studi di Napoli Federico II

Title: Nature-Inspired Optimization of Thermal Systems, from Small to Big

Abstract: Optimization is the key for evolution and transition to a better and more sustainable World. Thermal systems are everywhere to be found in most industrial, transport and civil applications. Thus, optimizing the design and operation of thermal systems is essential for everyone, from industrial stakeholders, to governments, to single individuals, with different objective functions, e.g., minimizing cost, carbon footprint, energy consumption, or maximizing profit, comfort, performance. This is a hard task because there isa plethora of thermal systems, deeply different from each other, from small heat sinks for electronic cooling, to big building envelopes. There is a plethora of optimization approaches, deeply different from each other, from single- to multi-objective, from deterministic to heuristic, from calculus to search methods. There is a plethora of possible objective functions, as mentioned, and design variables to define the system design and/or operation. So, which way to optimize thermal systems? Definity, it depends on different factors, such as system typology, size, complexity and governing physics/equations. However, the ultimate goal is always the same, that is maximizing the degree of freedom to achieve the best performance in a feasible way (say computational effort). Often, natural structures show us how to address this goal. Nature-inspired solutions can be achieved in different ways, e.g., via fractals, evolutionary algorithms, branching design, topology optimization, and so on.

This presentation provides some examples to address such a challenge for two extreme case studies, i.e., small heat sinks and wide building walls, achieving nature-inspired solutions in both cases. Topology optimization (TO), i.e., a calculus method optimizing material distribution within a design space for a given objective function, is applied by addressing different objective functions: minimizing the average temperature for the heat sink and maximizing the thermal resistance for the building wall. TO can be seen as an application of evolutionary design, which is advancing in several engineering fields, as predicted years ago by the constructal law: “For a finite-size system to live, it must evolve in such a way that it provides easier access to its currents”. Finally, fractals and branching design are applied to simplify and codify the achieved structures. This is the challenge for a large implementation of nature-inspired solutions. Finding correlations, laws, guidelines that can provide simplified solutions imitating nature as a function of case study, objectives and boundary conditions. That is finding simplified laws of natural structures.

Bio: Gerardo Maria Mauro was born in Benevento (Italy) on May 12, 1988. He is Associate Professor of Applied Thermodynamics and Heat Transfer at “Università degli Studi di Napoli Federico II”, Department of Architecture (DiARC). His main research topics concern: i) advanced modeling and optimization of heat transfer systems via computational fluid dynamics and numerical methods, e.g., topology optimization; ii) numerical simulation and optimization of building energy design or retrofit; iii) large-scale analysis of building stocks via machine/deep learning; iv) development and optimization of strategies for the model predictive control of energy systems; v) investigation of innovative building components for 3d printing; vi) modeling and optimization of thermal energy storage systems. He is author of more than **100** scientific publications at international level. According to SCOPUS database (December 2024) he has **H-Index** equal to **29** and more than **3000** citations. He is Associate Editor of the Journal “Energy Reports”, Elsevier. He is Editorial Board Member of the MDPI Journals “Sustainability”, “Energies”, “Buildings” and “Thermo”. He is Reviewer of around 30 international scientific Journals published by Elsevier, Taylor & Francis, MDPI and Springer. He is the winner of the "Buildings 2023 Young Investigator Award", offered by the international Journal "Buildings" MDPI.

Wednesday — March 12, 2025
12:45 PM - 1:45 PM

GWU Student Center, 3rd floor, Grand Ballroom

National Science Foundation

Generous financial support from

National Science Foundation (NSF)

is gratefully acknowledged.

This funding provided support for many students and early career faculty/ researchers to attend the conference.

ASTFE
American Society of Thermal and Fluids Engineers

10TH Thermal and Fluids Engineering Conference (Hybrid)

March 9-12, 2025
www.astfe.org/tfec2025/

INTRODUCTION TO MODERN COMPUTATIONAL FLUID DYNAMICS

WORKSHOP OUTLINE

Module 1: Background & Brief History

Module 2: The Governing Equations

Module 3: The Finite Volume Method

Module 4: Essential Numerical Concepts

Module 5: Turbulence

Module 6: Promises & Pitfalls

Module 7: Emerging Trends and CFD of the Future

MARCH 9, 2025

George Washington University, Washington, DC, USA (from 9 AM to 4 PM)

GWU, Studio Labs 1300

Dr. Akshai Runchal

President and Founding Partner, ACRi

ASTFE
American Society of Thermal and Fluids Engineers

10TH Thermal and Fluids Engineering Conference (Hybrid)

March 9-12, 2025
www.astfe.org/tfec2025/

MESHLESS METHODS FOR FLUID FLOW SIMULATIONS IN COMPLEX DOMAINS

WORKSHOP OUTLINE

Module 1: Interpolation of scattered data, global and cloud-based methods. Accuracy and stability

Module 2: Solution of heat conduction equation, multidomain methods

Module 3: Explicit and Semi-implicit fractional step methods for fluid flows

Module 4: Multilevel meshless method

MARCH 9, 2025

George Washington University, Washington, DC, USA (from 9 AM to 4 PM)

GWU, Studio Labs 1400

Pratap Vanka

Department of Mechanical Science and Engineering, UIUC

ASTFE
American Society of Thermal and Fluids Engineers

10TH Thermal and Fluids Engineering Conference (Hybrid)

March 9-12, 2025
www.astfe.org/tfec2025/

10TH THERMAL AND FLUIDS ENGINEERING CONFERENCE (Hybrid)

Partially online virtual and in person
at George Washington University, Washington, DC, USA

9-12 MARCH 2025

www.astfe.org/tfec2025/

Funding Opportunities for Advancements in Thermal and Fluid Engineering: NSF, ONR, DARPA, and ARPA-E

This panel discussion aims to provide an overview of funding opportunities available from various federal agencies to support research and advancements in the field of thermal and fluid engineering. The thermal and fluid engineering community plays an essential role in addressing challenges related to energy efficiency, environmental sustainability, and technological innovations. The panel will bring together experts from federal agencies including the National Science Foundation (NSF), Office of Naval Research (ONR), Defense Advanced Research Projects Agency (DARPA) and Advanced Research Projects Agency-Energy (ARPA-E) to shed light on the diverse funding programs, grants, and initiatives offered by government bodies. Attendees will gain insights into the specific focus areas as well as a clearer understanding of available funding streams and the tools needed to navigate the landscape of federal support for thermal and fluid engineering research and innovation.

DR. YOGENDRA JOSHI
Program Manager, Microsystems Technology Office, Defense Advanced Research Projects Agency (DARPA)
https://www.me.gatech.edu/news/yogendra-joshi-joins-darpa

DR. LAURENT PILON
UCLA/ARPA-E
https://arpa-e.energy.gov/about/team-directory/dr-laurent-pilon

DR. MARK SPECTOR
Office of Naval Research
https://www.linkedin.com/in/mark-spector-6976759/

DR. SHAHAB SHOJAEI-ZADEH
Program Director, Particulate & Multiphase Processes, Engineering Directorate I CBET Division, National Science Foundation
https://www.nsf.gov/staff/sshojaei

Monday — March 10, 2025
9:45 AM - 11:00 AM

GWU Student Center, 3rd floor, Grand Ballroom

ASTFE
American Society of Thermal and Fluids Engineers

10TH THERMAL AND FLUIDS ENGINEERING CONFERENCE (Hybrid)

Partially online virtual and in person
at George Washington University, Washington, DC, USA

9-12 MARCH 2025

www.astfe.org/tfec2025/

CHALLENGES AND INNOVATIONS IN THERMAL FLUIDS EDUCATION

Join us for an engaging panel discussion exploring the ever-changing dynamics of thermal fluids education. Esteemed educators and experts will discuss how we're tackling challenges with AI integration and smartphone utilization, revolutionizing teaching in this field. Discover strategies for engaging diverse learning styles and overcoming hurdles, celebrate triumphs and a roadmap for the future of thermal fluids education. This interactive panel opens the floor to your experiences, insights, and questions during our Q&A session.

DR. ZHUOMIN ZHANG

Professor of Mechanical Engineering, Georgia Institute of Technology

https://www.me.gatech.edu/faculty/zhang

DR. SURYA PRATAP VANKA

Professor Emeritus, Department of Mechanical Science and Engineering, UIUC

https://grainger.illinois.edu/about/directory/faculty/spvanka

DR. SANIYA LEBLANC

Professor, Mechanical & Aerospace Engineering, The George Washington University

https://engineering.gwu.edu/saniya-leblanc

Tuesday — March 11, 2025
9:30 AM - 10:45 AM

GWU Student Center, 3rd floor, Grand Ballroom

10TH THERMAL AND FLUIDS ENGINEERING CONFERENCE (Hybrid)

Partially online virtual and in person
at George Washington University, Washington, DC, USA

9-12 MARCH 2025

www.astfe.org/tfec2025/

Strengthening the Thermal and Fluids Engineering Workforce: Challenges and Solutions

Panelists will discuss not only approaches for enhancing the recruitment of students/researchers from underrepresented populations, but also the need for enhanced retention. We must devote sustained and significant efforts to both recruitment and retention, with climate, in particular, as a focus. How do we make our workplaces and professional communities a place where women and underrepresented individuals enjoy working and want to continue to work. Panelists will share their experiences and the audience will participate in a discussion for audience-centered approaches.

DR. PAMELA M. NORRIS

Dean, College of Engineering, University of Delaware

https://www.udel.edu/udaily/2024/november/pamela-norris-dean-engineering-college/

DR. MEGAN LEFTWICH

The George Washington University

https://engineering.gwu.edu/megan-leftwich

DR. LESLIE M. PHINNEY

Sandia National Laboratories

https://www.researchgate.net/profile/Leslie-Phinney

Wednesday — March 12 2025
9:30 AM - 10:45 AM

GWU Student Center, 3rd floor, Grand Ballroom

Sunday — March 9, 2025

Time	Session	Room	Author
9:00 AM - 4:00 PM	**Course on Meshless Methods for Fluid Flow Simulations in Complex Domains**	GWU, Studio Labs 1400	**Pratap Vanka** Department of Mechanical Science and Engineering, UIUC
10:00 AM - 4:00 PM	**Course on Intro to Modern CFD**	GWU, Studio Labs 1300	**Akshai Runchal** President and Founding Partner, ACRi
12:00 PM - 6:00 PM	**Conference Registration**	GWU Student Center, 3rd floor, Hallway	
12:00 PM - 2:00 PM	**ASTFE Board of Directors Meeting (Closed Door)**	GWU Student Center, 3rd floor, room 302	
3:00 PM - 4:00 PM	**ASTFE Executive Committee Meeting (Closed Door)**	GWU Student Center, 3rd floor, room 302	
4:00 PM - 5:00 PM	**ASTFE Board of Directors Meeting and Executive Committee Meeting (Open Door)**	GWU Student Center, 3rd floor, room 302	
5:00 PM - 7:00 PM	**Welcome Reception** (Dean Pamela Norris, *University of Delaware*; Francine Battaglia, *President of ASTFE*; Lorenzo Cremaschi, *Chair of ASTFE Executive Committee*, Like Li, *Technical Program, Conference Tools, Venue, Events Overview*; Kausik Sarkar *on NSF funding*; Akshai Runchal: *Brief on the Course on Into to Modern CFD*; Pratap Vanka: *Brief on the Course on Meshless Methods*; Ashwani Gupta: *Into on IJECE journal*; Wilson Chiu: *Into on CTS journal*; Exhibitors and Sponsors: *Begell House, publishers, NSF, GWU*)	GWU Student Center, 3rd floor, Grand Ballroom	

Monday — March 10, 2025

Time	Session	Room	Title	Author
8:00 AM - 10:00 AM	**Breakfast and coffee**	GWU Student Center, 3rd floor, Hallway		
8:00 AM - 8:30 AM	**Welcome Address Opening Remarks**	GWU Student Center, 3rd floor, Grand Ballroom	Kausik Sarkar, *George Washington University;* Francine Battaglia, *President of ASTFE;* Hamidreza Najafi, *Technical Program overview;* Nesrin Ozalp: *Conference Tools, Venue and Events Overview*	
8:30 AM - 9:30 AM	**Plenary Lecture 1**	GWU Student Center, 3rd floor, Grand Ballroom	**Co-Optimization of Ion and Heat Transport for Efficient Energy Conversion**	**Ravi Prasher,** Bloom Energy **Moderator: Pamela Norris,** UDel
9:30 AM - 9:45 AM	**Break**			
9:45 AM - 11:00 AM	**PANEL 1** **Moderator: Nesrin Ozalp** Illinois State University	GWU Student Center, 3rd floor, Grand Ballroom	**Funding Opportunity for Advancements in Thermal and Fluids Engineering: ONR, DARPA, ARPA-E, and NSF**	**Yogendra Joshi,** DARPA **Shahab Shojaei-Zadeh,** National Science Foundation **Laurent Pilon,** UCLA/ARPA-E **Mark Spector,** Office of Naval Research
11:00 AM - 11:15 AM	**Break**			
11:15 AM - 12:45 PM	**One to one meeting with Program Directors of Funding panel**	GWU Student Center, 3rd floor, Grand Ballroom	**Yogendra Joshi**: Monday 11:15 AM - 12:45 PM **Shahab Shojaei-Zadeh:** Monday 11:15 AM - 12:45 PM **Laurent Pilon**: Monday 4 PM - 5:30 PM **Mark Spector:** Tuesday 11 AM - 12:30 PM	
	Technical Session 1			
	Morning SESSIONS			
11:15 AM - 12:45 PM	**SESSION 1A** **ID: Fundamentals in Fluid Flow and Heat/Mass Transfer-01** **Chair:** **Marcello Iasiello** Università degli Studi di Napoli Federico II	GWU Student Center, 3rd floor Room 301	55723 - Wake Interaction for Inline Circular and Square Section Cylinders at Re = 150	Suraj Kumar Mishra IIT Madras
			55793 - Flow Induced Vibration of a Circular Cylinder in Presence of Fixed Downstream Staggerd Cylinder	Shristi Singh IIT Madras
			55890 - A Simplified Reduced Order Model to Predict Phase Change Materials Heat Transfer Including Natural Convection	Marcello Iasiello UniNa
			56034 - Closed-Form Solution for the Compressible Flow of Ideal Gas With Both Friction and Heat Transfer	Adam Arona The University of Akron
			56043 - Characterizing Flow and Mass Transfer Dynamics in Annular Flow Between Two Rotating Permeable Discs	Mertcan Samgar Cleveland State University
11:15 AM - 12:45 PM	**SESSION 1B** **ES: Energy Storage Systems** **Chair:** **Saeed Tiari** Widener University	GWU Student Center, 3rd floor Room 302	55757 - Thermochemical Energy Storage - Fundamental Research and Reactor Concept Evolution	Jaroslaw Zuwala Institute of Energy and Fuel Processing Technology
			56000 - Characterizing Thermal, Electric, and Structural Responses of Electrically Charged Firebricks for Industrial Thermal Battery Applications	Elif Asar Electrified Thermal Solutions
			56063 - Thermal Performance Enhancement of a Sensible Heat Thermal Energy Storage Systems using Copper Additives	Saeed Tiari Widener University
			56123 - Thermomechanical Modeling and Analysis of a High-Temperature Light Trapping Planar Cavity Receiver	Ouidad Abourazzouk UCF

Time	Session	Room	Title	Author
11:15 AM - 12:45 PM	**SESSION 1C** **ID: Computational Methods/ Tools in Thermal-Fluid Systems-01** **Chair:** **Marcelo J.S. de Lemos** ITA	GWU Student Center, 3rd floor Room 307	55848 - An Implicit/Explicit Numerical Method for Phase-Chage Heat Transfer Based on Porous Media Formulation	Marcelo J.S. de Lemos ITA
			55320 - Numerical Modelling of Heat Transfer and Pressure Drop in a Wavy-finned Flat-tube Heat Exchanger	Sybrand Johannes van der Spuy Stellenbosch University
			55880 - Numerical Simulation of Mixed Vapor Shear Stress on Film Condensation of R134a and its Alternatives on Single Tubes and Tube Bundles – A Brief Review	Michael Akinseloyin Kansas State University
			55882 - A Coupled Boundary Condition for Thermal-Fluid Conjugate Heat Transfer Analysis	Elisan Magalhaes Aeronautics Institute of Technology
			55895 - Branching Generative Design to Codify Topology-Optimized Heat Conduction Structures	Andrea Fragnito Università degli Studi di Napoli Federico II
11:15 AM - 12:45 PM	**SESSION 1D** **TS: Electronics Cooling** **Chair:** **Huseyin Bostanci** University of North Texas	GWU Student Center, 3rd floor Room 308	55892 - Experimental and Numerical Analysis of the Refrigeration Capacity of Flat Plate Cooling Systems: Single-Channel vs. Canopy-to-Canopy Configurations	Antonio Soria Verdugo, Jose Felix Guil-Pedrosa Universidad Carlos III de Madrid
			55919 - Two-Phase Spray Cooling with Binary Mixtures for Thermal Management of Automotive Power Electronics	Daitva Bali, Huseyin Bostanci University of North Texas
			55965 - Investigation of the Influence of Flow Boiling Induced Ageing on Copper Channel Surface Characteristics	Saravanaraj Manivannan IIT Madras
			56216 - Stacked Flapping Beams for Electronic Cooling	Jingru Benner Western New England University
			56421 - Space snd Time Discretized Heat Exchanger Model for Cryogenic Power Trains	Chaianan Sailabada Florida State University
11:15 AM - 12:45 PM	**SESSION 1E** **FD: Multiphase Flows-01** **Chair:** **Darshan Pahinkar** Florida Institute of Technology	GWU Student Center, 3rd floor Room 310	55610 - Water Hammer Waves Simulations using a Homogeneous Equilibrium Model	Dia Zeidan German Jordanian University
			55918 - Effects of Multi-component Surrogates on the Dynamics of Non-Reacting Diesel Fuel Spray	Matthew Pruitt UTC
			55941 - Effect of Baffle Shapes on Wave Response in a Partially Filled Cylinder Subjected to Lateral Oscillation	Sadham Usean Ramasamy IIT Madras
			56021 - Shear-Induced Collective Diffusivity of Viscous Drops in Viscoelastic Media using Dynamic Structure Factor	Amirreza Rezaeepazhand The George Washington University
			56081 - Rimming Speed Analysis of Paper Dryer Cylinder	Alif Muhammad Shafiyee, Ting Wang University of New Orleans
11:15 AM - 12:45 PM	**SESSION 1F** **ID: Machine Learning and Artificial Intelligence in Thermo-Fluid Engineering** **Chairs:** **Akshai Runchal** President and Founding Partner, ACRi	GWU Student Center, 3rd floor Room 311	55660 - Study of PV Modules Temperature Sensitivity to Weather Parameters in Solar Farms: CFD and Machine Learning Approaches	Svetlana Tkachenko, Victoria Timchenko UNSW Sydney
			56017 - Joint Radiation and Recombination in Nanoporous Thin Film Solar Cells using Deep Learning	Farhin Tabassum Stevens Institute of Technology
			56068 - Deep Learning-Assisted Prediction of Porous Structures for Enhanced Heat Transfer with Oscillating Flows in Porous Media	Lichang Zhu University of Houston
			55517 - Extending Deep Learning U-Net Architecture for Predicting Fluid Flows in Textured Microchannels	Ganesh Sahadeo Meshram IIT Kharagpur
			55996 - Application of a Pinn Model Based on CFD Data for Modeling Flow Around a Cylinder Under Thermal Effects	Aidana Sabyrkulova Kazakh-British Technical University
11:15 AM - 12:45 PM	**SESSION 1G** **ES: Thermal Management of Energy Systems** **Chair:** **Titan Paul** University of South Carolina Aiken	GWU Student Center, 4th floor Room 403	55714 - Isothermal Compression with PCM Bubbles	Sylvie Lorente, Meghana Athadkar Villanova University
			56259 - Numerical Investigation of Nanofluid-Based Thermal Management of Electric Vehicle Batteries	Soheil Omiddezyani The University of Alabama
			55991 - Bubble Column Evaporative Cooling for PEMFC Thermal Management in Heavy-Duty Vehicles	Christian Bosser Chalmers University of Technology
			56270 - Experimental Analysis of Lithium-Based Batteries Cooling System using Phase-Change Materials for Electric Vehicles	Oronzio Manca Università Vanvitelli
			56220 - Performance Analysis of Mini-Channel Heat Sinks with Jet-Impingement and Secondary Flow	Titan Paul University of South Carolina Aiken
11:15 AM - 12:45 PM	**SESSION 1H** **FD: Green Energy CFD Competition** **Chair:** **Wayne Strasser,** Liberty University	GWU Student Center, 4th floor Room 405	55907 - results	Amirhosein Sarchami University of Cincinnati
			56944 - results	Abdulrahman Alzailaie University of Wisconsin-Madison
12:45 PM - 1:00 PM	**Break**			
1:00 PM - 2:00 PM	**Luncheon**	GWU Student Center, 3rd floor, Grand Ballroom		

Time	Session	Room	Title	Author
1:00 PM - 2:00 PM	ASTFE Technical Committee Meetings	GWU Student Center, 3rd floor Room 301	**Thermal Sciences Technical Committee (Chair: Huseyin Bostanci,** University of North Texas; **Vice-chair: Like Li,** University of Central Florida)	
		GWU Student Center, 3rd floor Room 302	**Fluid Dynamics Technical Committee (Chair: Kevin Anderson,** Calif. State Polytechnic University, Pomona; **Vice-chair: Aarthi Sekaran,** Suny Polytechnic Institute)	
		GWU Student Center, 3rd floor Room 307	**Energy and Sustainability Technical Committee (Chair: Sylvie Lorente,** Vilanova University; **Vice-chair: Sean Orchuk,** Interlock Energy)	
		GWU Student Center, 3rd floor Room 308	**Ethics and Education Technical Committee (Chair: Shima Hajimirza,** Stevens Institute of Technology)	
		GWU Student Center, 3rd floor Room 310	**ASTFE Student Committee (Chair: Bengisu Sisik,** George Washington University)	
2:00 PM - 2:15 PM	Break			
2:15 PM - 3:00 PM	Keynote Sessions in Parallel Moderator: Hamidreza Najafi Florida Institute of Technology	GWU Student Center, 3rd floor, Grand Ballroom	**Emerging Technologies for Future Energy Challenges: From Concentrating Solar Power, Seasonal Storage, to Hybrid Energy Systems**	**Guangdong Zhu** NREL
3:00 PM - 3:45 PM			**Mitigating Chemical and Thermal Failures of Engineered Wettability Surfaces**	**Daniel Preston** Rice University
2:15 PM - 3:00 PM	Keynote Sessions in Parallel Moderator: Kausik Sarkar George Washington University	GWU Student Center, 1st floor, Betts Theater	**Understanding Thermal Transport for Electronics, Energy, Quantum, and Space Applications**	**Zhiting Tian** Cornell Engineering
3:00 PM - 3:45 PM			**Near Isothermal Compressed Air Energy Storage For Wind Turbines**	**Eric Loth** University of Virginia
3:45 PM - 4:00 PM	Break			
			Technical Session 2	
			Afternoon SESSIONS	
4:00 PM - 5:30 PM	**SESSION 2A** **ES: Energy-Water-Food Nexus** **Chair:** **Mahyar Pourghasemi,** Western New England University	GWU Student Center, 3rd floor Room 301	57502 - Electro-Cyclonic Water Desalination Technology	Lorenzo Cremaschi Auburn University
			56035 - Sustainable Frost Prevention System	Leah Sklar The College of New Jersey
			56039 - Water Desalination via Centrifugal Reverse Osmosis: Thermodynamic Equilibrium and Mass Transfer-Controlled Methods	Hasib Ahmed Prince Binghamton University
			57582 - Competition between Adsorption and Wetting in Hydrophobic Adsorbent Coatings	Darshan Pahinkar, Samuel Babatunde Olushola Florida Institute of Technology
			55596 - Effects of Different Air Intake Rate on Static Water Pool in a High Vacuum Environment	Sarvjeet Singh IIT Jodhpur
4:00 PM - 5:30 PM	**SESSION 2B** **ES: Alternative Energy Conversion Systems (Wind, Biomass, Nuclear, etc.)** **Chair:** **Prashant Saini,** National Renewable Energy Laboratory	GWU Student Center, 3rd floor Room 302	55916 - Auxiliary Augmentation Approach of Dual Rotor Vertical Axis Wind Turbine	Belal Shanab Virginia Tech
			56346 - Taguchi-Based Sensitivity Analysis of Hydrodynamic and Power Take-Off Design Parameters for Oscillating Surge Wave Energy Converters	Md Riasat Morshed Khan Khan Virginia Tech
			55915 - Heat Transfer Correlations For Laminar, Developing Flow With Constant Heat Flux And Constant Heat Generation In Circular Ducts And Parallel Plates	Isabella Alcorn Texas A&M University
			55926 - Steady-State and Transient System Curve Prediction, with Uncertainty, for the Molten Salt Research Reactor in Abilene Texas	Sean Simonian Texas A&M University
			56069 - Performance Analysis of Employing Fogging on a Gas Turbine at Various Part-Load Conditions to Cope with Intermittent Renewable Energy Generation	Ting Wang University of New Orleans
4:00 PM - 5:30 PM	**SESSION 2C** **FD: Rheology of Nonlinear Materials and Complex Fluids** **Chair:** **Udit Sharma,** Tennessee Technological University	GWU Student Center, 3rd floor Room 307	56010 - Numerical Investigation of Developing Flow of Viscoelastic Fluids in a Tube	Hassan Pouraria General Motors R&D
			56323 - Trajectories of Interacting Viscous Drops in a Shear-Thinning Viscoelastic Media	Haoqian Wang The George Washington University
			56399 - Rheological Modeling of a Non-Newtonian Cement Suspension: The Effect of Particle Concentration Dependent Viscosity	Chengcheng Tao Purdue University
			56461 - Solute Dispersion of Electroosmotic Flow of Micropolar Fluid with Inhomogeneous Reaction in Porous Medium	Duryodhan Subudhi NIT Warangal
			55998 - Numerical Study the Disintegration of an Intranasal Spray Jet in the Human Upper Respiratory Tract using the VOF-to-DPM Model	Alibek Issakhov Kazakh-British Technical University
4:00 PM - 5:30 PM	**SESSION 2D** **FD: Multiphase Flows-02** **Chair:** **Svetlana Poroseva,** University of New Mexico	GWU Student Center, 3rd floor Room 308	56191 - Atomization with High-Blockage Self-Swirling Waves	Wayne Strasser Liberty University
			56192 - Computations of Three-Phase Flows	Gretar Tryggvason Johns Hopkins University
			56343 - Exploring Aerosol-Gas Dynamics in Fluidic Oscillator Ventilation	Ryan Learn Liberty University
			56348 - Advanced Numerical Modeling of OSWEC using OpenFOAM and Overset Mesh Strategy	Minge Jiang Virginia Tech
			57585 - Exploring Two-Dimensional Flows in Evaporating Thin Films: A Step Towards a Dynamic Model	Ayaaz Yasin University of Cincinnati

Time	Session	Room	Title	Author
4:00 PM - 5:30 PM	**SESSION 2E** **ID: Fluid Flow and Heat Transfer in Industrial and Commercial Processes** **Chair:** **Forooza Samadi,** University of Alabama	GWU Student Center, 3rd floor Room 310	55927 - Experimental Study of Hot-Water Temperature and Injection Rate Effects on Hot-Water Flooding in Heavy Oil Reservoirs	Yongan Gu University of Regina
			56082 - A 2D Model of Condensate Extraction in a Rotating Paper Dryer Implemented with Source and Sink	Alif Muhammad Shafiyee University of New Orleans
			56397 - Computational Fluid Dynamics Modeling of Chemical Species Transport and Gaseous Combustion of Methane	Rongze Hu Purdue University
			57503 - High Voltage Electrostatic-Assisted Industrial Paper Drying with Augmented Water Vapor Recapturing Technology	Lorenzo Cremaschi Auburn University
			56006 - Turbulent Statistics and Heat Transfer Around a Wall-Mounted Prism in a Boundary Layer	Richard Sanchez University of Puerto Rico
4:00 PM - 5:30 PM	**SESSION 2F** **TS: Heat Transfer in Multiphase Flows** **Chair:** **Huseyin Bostanci,** University of North Texas	GWU Student Center, 3rd floor Room 311	56159 - A Comprehensive Bifurcation Analysis of Two-Phase Flow Instabilities in a Heated Channel	Suneet Singh IIT Bombay
			56366 - A Novel Swirl Flow Separator for Solar-Thermal Desalination Applications	Chinmay Rajesh Chavan Texas A&M University
			57581 - A Simple Heat Transfer Model for Annular Flow Condensation	Lingnan Lin University of Maryland
			57583 - Leveraging Temperature-dependent Wettability to Control Flow in Porous Media	Amirhosein Sarchami University of Cincinnati
			57586 - Pressure-Temperature Correlations for the Boundaries of Anomalous Region	Laura Almara University of North Texas
4:00 PM - 5:30 PM	**SESSION 2G** **ID: Fundamentals in Fluid Flow and Heat/Mass Transfer-02** **Chair:** **Dia Zeidan,** German Jordanian University	GWU Student Center, 4th floor Room 403	57592 - Supercritical Transport Model: Governing Equations, Dimensionless Parameters, and Joule-Thompson Effect	Raad Shahmat Haque University of North Texas
			56401 - Reduced Order Modeling of Fluid-Structure Interactions (FSI) for Flow in Ducts of Circular Cross-Sections	Syed Anas Nisar Texas A&M University
			56237 - Applying a Structured Problem-Solving Approach to Improve Dynamics, Fluid Mechanics, and Thermodynamics Education	Birce Dikici ERAU
			55252 - Energy Efficiency and Energy Conversion Efficiency	Yongjian Gu US Merchant Academy
			56065 - Bringing Numerical Methods to Life in an Undergraduate Heat Transfer Course	Gunnar Tamm US Military Academy
5:30 PM - 5:45 PM	**Break**			
			Networking Session + Poster Session	
5:45 PM - 6:45 PM	**POSTER SESSION** **Chair:** **Hamidreza Najafi** Florida Institute of Technology	GWU Student Center, 3rd floor Hallway	56024 - Advanced Micro-fabrication for Radiative Property Characterization of Porous Packed Beds using Two-Photon Polymerization (TPP) Technique	Farhin Tabassum Stevens Institute of Technology
			56341 - Development of a Calibrated Supercritical CO2 Densimeter using Raman Spectroscopy	Danielle Werts, Jinbo Chen East Carolina University
			57564 - Energy Challenges in Developing a Desiccant-Based Atmospheric Water Harvester	Gokul Chandrasekaran Arizona State University
			56125 - Thermoelectric Module Performance with Differing Leg Shapes	Jairo Sanchez George Washington University
			57433 - Dynamic Analysis of Charging Efficiency in Hydrogen Refueling Stations Utilizing the Cold Energy of Liquid Hydrogen	Taemin Jung University of Seoul
			55851 - A Method to Design the Cooling Loops in Battery Energy Storage Systems.	Chimezie Oguike Villanova University
			55873 - Advances in Lithium-ion Battery Thermal Management: Exploring the Potential of Phase Change Materials	Mahdieh Nasiri Stevens Institute of Technology
			55863 - Flow Uniformities In Microchannels of SOFC	Sarng Woo Karng Korea Institute of Science & Technology
			57504 - Prediction of Thermal Conductivity of Ionic Liquids-Based Nanofluids using Machine Learning (ML)	Truman Brabham University of South Carolina Aiken
			57595 - Desalination Through Reverse Osmosis Utilizing a Temperature Gradient	Taylor Hatch Boise State University

Tuesday — March 11, 2025

Time	Session	Room	Title	Author
8:00 AM - 10:00 AM	**Breakfast and coffee**	GWU Student Center, 3rd floor, Hallway		
8:00 AM - 8:15 AM	**Day 2 Announcements**	GWU Student Center, 3rd floor, Grand Ballroom	Opening by **Kausik Sarkar**, George Washington University **Like Li**: Overview of Day 1 and Day 2 plan. **Nesrin Ozalp**: Conference Tools, Venue and Events Announcements	
8:15 AM - 9:15 AM	**Plenary Lecture 2**	GWU Student Center, 3rd floor, Grand Ballroom	**From Wave-Powered Propulsion to Flight with Membrane Wings: Insights Powered by High-Fidelity Immersed Boundary Methods based FSI Simulations**	**Rajat Mittal** Johns Hopkins University **Moderator:** **Kausik Sarkar** George Washington University
9:15 AM - 9:30 AM	**Break**			
9:30 AM - 10:45 AM	**PANEL 2** **Moderator:** **Nesrin Ozalp** Illinois State University	GWU Student Center, 3rd floor, Grand Ballroom	**Challenges and Innovations in Thermal Fluids Education**	**Zhuomin Zhang** Georgia Institute of Technology **Pratap Vanka** UIUC **Saniya LeBlanc** George Washington University
10:45 AM - 11:00 AM	**Break**			
11:00 AM	**Lab Tour by Saniya LeBlanc**	Please meet 5 minutes before your tour near the conference registration desk. You will be greeted and a guide will escort you to the facility. You will need to walk 5 to 20 minutes to reach the laboratories		
		GWU, Mechanical & Aerospace Engineering Department	**LeBlanc Lab. We create energy conversion technologies using advanced materials and manufacturing techniques** https://www.leblanclab.com	**Saniya LeBlanc** Professor of Engineering and Applied Science, Department of Mechanical & Aerospace Engineering, GWU
Technical Session 3				
Morning SESSIONS				
11:00 AM - 12:30 PM	**SESSION 3A** **FD: Turbulent Flows** **Chair:** **Svetlana Poroseva,** University of New Mexico	GWU Student Center, 3rd floor Room 301	55813 - Accelerating Turbulence Model Simulations with a High-Efficiency GPU-Optimized Algorithm	Arthur Mendonca de Azevedo Aeronautics Institute of Technology
			56067 - Design and Analysis of a Mini-Propeller TCPC Assembly for Fontan Patients	Shubham Rath Virginia Tech
			56964 - DNS Study of the Turbulent Mixing Layer Self-similarity	Svetlana Poroseva University of New Mexico
			57722 - Accelerated High Resolution Computation of Heat Conduction with Discrete Heat Sources	Pratap Vanka UIUC
			56042 - Evaluating Turbulence Models for the Actuator Disk Approach at Optimal Turbine Efficiency	Matthew Baker Binghamton University
11:00 AM - 12:30 PM	**SESSION 3B** **FD: Nano and Micro Fluids Applications** **Chair:** **Marcelo J.S. de Lemos,** Instituto Tecnologico de Aeronautica	GWU Student Center, 3rd floor Room 302	56025 - Microbubbles for Subharmonic Scattering Aided Blood Pressure Estimation	Mehmet Yapar George Washington University
			56143 - Long-Term Size Stability and Acoustic Properties of Lipid-Coated Microbubbles	Saikat Halder George Washington University
			56225 - Numerical Investigation on Effect of Inclination Angle on Natural Convection With Nanofluids in Channels Asymmetrically Heated	Oronzio Manca Università Vanvitelli
			57188 - Experimental Investigation of Nano-Enhanced-PCM-Based Heat Sinks for Passive Thermal Management of Small Satellites	Andrew Cisco Alfred University
11:00 AM - 12:30 PM	**SESSION 3C** **TS: Combustion, Fire and Fuels** **Chair:** **Patrick Mensah,** Southern University and A&M College	GWU Student Center, 3rd floor Room 307	55877 - Reduced Large Eddy Flame Simulation, Dimensional Surrogate Approach	Hessam Mirgolbabaei University of Minnesota
			55988 - Rapid Generation of Heat and Cavity Underwater via the Combustion of Thermally Insulated Energetic Nanomaterials	Anqi Wang University of Waterloo
			56689 - Experimental Study of the Characteristics of a Hydrogen Flame from a Small Leak	Yogesh Jaluria Rutgers University
			57614 - Improving Methanol Engine Efficiency and Emissions with Lean Burn Strategies and Effective Compression Ratio Control	Choongsik Bae KAIST

Time	Session	Room	Title	Author
11:00 AM - 12:30 PM	**SESSION 3D** **ES: Solar Energy Equipment and Processes** **Chair:** **Titan Paul,** University of South Carolina Aiken	GWU Student Center, 3rd floor Room 308	55546 - Computational Fluid Dynamics Model of Heat Transfer in the Vicinity of Photovoltaic Panels	Scott Vanderlan Tennessee Tech University
			56199 - Techno-Economic Analysis of a 1MW Linear Fresnel and Parabolic Trough Concentrated Solar Power Plants for Botswana - A Comparative Study	Kevin N. Nwaigwe University of Botswana
			56415 - Assessment of the Performance of Photovoltaic Panels Under Future Climate Conditions	Moataz Alghamdi Florida Institute of Technology
			56235 - Improving the Performance of Transcritical CO2 Heat Pumps for Temperate Environments	Jorge Gonzalez-Cruz University at Albany
11:00 AM - 12:30 PM	**SESSION 3E** **ID: Flow and Heat Transfer in Biological Systems-01** **Chair:** **Saeed Tiari,** Widener University	GWU Student Center, 3rd floor Room 310	55369 - Interactive Effects of Water Content and Temperature on Soil Thermal Properties: A Laboratory Analysis	Achamyeleh Mengistu University of the Free State
			55846 - A Multiscale Meshless Method For Simulating Cardiovascular Flows	Alain Kassab University of Central Florida
			55884 - Patient-Specific Release of the Aerosols from the Spacer and its Effect on the Drug Delivery to the Human Lungs	Mir Arman Mirzaaghaian Amiry Western Sydney University
			56066 - Numerical Simulation of Electromagnetic Field-Induced Heating in Coronary Stents During MRI	Saeed Tiari Widener University
			56417 - Thermal Transient Modeling of a Particle Storage Tank for Concentrating Solar Power	Juan Nanclares Florida State University
11:00 AM - 12:30 PM	**SESSION 3F** **ID: Experimental Methods/Tools in Fluid Mechanics and Heat/ Mass Transfer-01** **Chair:** **Like Li,** University of Central Florida	GWU Student Center, 3rd floor Room 311	56033 - Liquid Droplet Profile Change During Evaporation using Transmission Interference Fringe	Iltai (Isaac) Kim Texas A&M University-Corpus Christi
			57443 - An Investigation into Passive Bubble Dynamics in Microgravity Two-Phase Capillary Systems Against ISS CFF Benchmarks	Tyler Hatch NASA Glenn Research Center
			56193 - Design of Rayleigh-Taylor Instability Experiments Driven by Volumetric Energy Deposition	Adam Wachtor Los Alamos National Laboratory
			57584 - Optimization of Additively Manufactured Porous Media for Thermal Management Applications	Maxwell Hewes Boise State University
			55997 - Prediction of Emissions of Concentration Value using Machine Learning and Computational Fluid Dynamics Methods from an Enterprise	Nurtugan Rysmambetov Kazakh-British Techneical University
11:00 AM - 12:30 PM	**SESSION 3G** **TS: Heat/Mass Transfer Enhancement Techniques-01** **Chair:** **Mahyar Pourghasemi,** Western New England University	GWU Student Center, 4th floor Room 403	54984 - Heat Transfer Characteristics of Impinging Jets on Porous Surface	Kyosung Choo Youngstown State University
			55693 - Impact of Ambient Temperature and Porous Media Characteristics on Melting Performance of Phase Change Material Based Heat Sink	Sreenath Vaidyanathan Ramadas IIT Palakkad
			55797 - An Initial Correlation for Free Convection in Metal Foams	Hannah Klatzke, Nihad Dukhan University of Detroit Mercy
			55824 - Flow and Heat Transfer in 3D-Printed Tubes with Porous Infills	Mahyar Pourghasemi Western New England University
			55879 - Numerical Investigation of a Novel Phase Change Material Based Heat Sink with Different Configurations	Prashant Saini National Renewable Energy Laboratory
12:30 PM - 2:30 PM	**Buffet Luncheon**			
1:00 PM - 1:45 PM	**Keynote Luncheon Talk**	GWU Student Center, 3rd floor, Grand Ballroom	**On the Nexus of Climate, Energy and Air Quality in Complex Urban Environments**	**Jorge Gonzalez-Cruz** University of Albany **Moderator:** **Like Li** University of Central Florida
1:45 PM - 2:15 PM	**Awards (TFE Award, Best Paper, Best Reviewer)**	GWU Student Center, 3rd floor, Grand Ballroom	**TFE Award, The ASTFE Fellows – moderator: Francine Battaglia**, University at Buffalo **TFEC2024 Conference Chairs and Session Chairs – moderator: Lorenzo Cremaschi**, Auburn University **Best Papers and Best Reviewers – moderator: Jon Longtin**, Stony Brook University	
2:15 PM - 2:30 PM	**Break**			

Time	Session	Room	Title	Author
2:30 PM - 3:30 PM	**TEC Talks** **Moderator:** **Wilson K. S. Chiu** University of Connecticut	GWU Student Center, 3rd floor, Grand Ballroom	**Strategies to Best Leverage AI and Machine Learning to Create Breakthrough Energy and Thermal Management Technologies**	**Van P. Carey** Berkeley Mechanical Engineering
			Emerging Thermal Technologies for Plug and Abandonment of Oil Wells	**Marcelo J.S. de Lemos** Instituto Tecnologico de Aeronautica
			Cold Plasma for Medicine	**Michael Keidar** George Washington University
			Driving Research Excellence and Technology Innovation at GW Engineering and Personal Experience in 4D Bioprinting	**Lijie Grace Zhang** George Washington University
3:30 PM - 3:45 PM	**Break**			
3:45 PM - 4:30 PM	**Keynote Session**	GWU Student Center, 1st floor, Betts Theater	**NanoFin Effect (nFE)**	**Debjyoti Banerjee** Texas A&M University **Moderator:** **Jon Longtin** Stony Brook University
		GWU Student Center, 3rd floor, Grand Ballroom	**From Atoms to Flow: Exploring Evaporation and Condensation in Nano-Channels**	**Ali Beskok** Southern Methodist University **Moderator:** **Nesrin Ozalp** Illinois State University
4:30 PM - 4:45 PM	**Break**			
Technical Session 4				
Afternoon SESSIONS				
5:00 PM - 6:30 PM	**SESSION 4A** **TS: Flow and Heat Transfer in Materials Processing Science and Manufacturing** **Chair:** **David Hwang,** Stony Brook University	GWU Student Center, 3rd floor Room 301	56390 - Laser Scribing of Flexible Thin Film Photovoltaic Solar Cells	David Hwang Stony Brook University
			57590 - Influence of Surface Activation Energy on Quantum Vibration Modeling of Chemical Vapor Infiltration	Murat Barisik University of Tennessee at Chattanooga
			56046 - Thermal Vacuum Test of the Structural-Thermal Model of a 3U CubeSat	Eslem Enis Atak ASELSAN
			54985 - Heat Transfer Modeling of DED Hybrid Additive Manufacturing Technology using 316L Stainless Steel	Kyosung Choo Youngstown State University
			56232 - Numerical Study on Interaction of Smoke and Fabric	Sai Guruprasad Jakkala Iowa State University
5:00 PM - 6:30 PM	**SESSION 4B** **ID: Computational Methods/ Tools in Thermal-Fluid Systems-02** **Chair:** **Akshai Runchal,** President and Founding Partner, ACRi	GWU Student Center, 3rd floor Room 302	55981 - Integrated Aerothermal Heating Predictions in the ONYX Thermal Modeling Software	Dean Schrage
			56184 - Reconstructing a Multimodal Polymer Molecular Weight Distribution in CFD	Elijah Yoder Liberty University
			56222 - GPU-Accelerated Simulation of Thermal-Induced Von Kármán Flow Around a Single Cylinder	Daniel Botezelli ITA
			55589 - Complementary Tasks in the Numerical Optimization of a Cooling Device by Means of the Parametric Study and the Generative Design Tool	Mirza Popovac Austrian Institute of Technology
			56048 - Shape Optimization of a Cylindrical Centrifugal Reverse Osmosis Module within a Turbine Wake	Alperen Turkyilmaz Binghamton University
5:00 PM - 6:30 PM	**SESSION 4C** **TS: Heat/Mass Transfer Enhancement Techniques-02** **Chair:** **Huseyin Bostanci,** University of North Texas	GWU Student Center, 3rd floor Room 307	55889 - Thermo-Aerodynamic Performance Sensitivity to Dimple's Design in Turbulent Channel Flow	Mahmoud Nasr National University of Singapore
			55924 - Heat Transmission Performance of a Double Tube Heat Exchanger with Straight Splined Inner Tube and Twisted Tape	Jitendra Kumar IIT Kharagpur
			56030 - Enhanced Thermal Management of Lithium-Ion Batteries using Phase Change Material Integrated with Gap Design Under Severe Ambient Conditions	Vanita Arjun Wagh IIT Bombay
			56032 - Numerical Investigation of Dielectrophoresis Force on Porous Media Drying in Continuous and Batch Processes	Elif Asar Electrified Thermal Solutions
			56047 - Effects of Particle Sizes, Polyvinyl Alcohol, and Polyethylene Glycol Composition on Thermal Conductivity of Freeze-Cast Copper	Joseph Sheppard University of Maryland Baltimore County

Time	Session	Room	Title	Author
5:00 PM - 6:30 PM	**SESSION 4D** **TS: Innovations in Heat Exchangers-01** **Chairs:** **Prashant Saini,** National Renewable Energy Laboratory	GWU Student Center, 3rd floor Room 308	54671 - Optimizing Air-Cooled Heat Exchanger Design using Genetic Algorithms	Kevin Farrell Heat Transfer Research, Inc.
			55925 - The Role of TPMS Structure on Effective Thermal Conductivity	Wilson Chiu, Maxwell Bartlett University of Connecticut
			55959 - Modelling the Full Transient in a Shell and Tube Heat Exchanger Tube Rupture Event	Matteo Paglialunga, Enrico Bonato SAIPEM SpA
			55986 - Optimization and Demonstration of Non-Round Microtube Heat Exchangers	Daniel Murphy Mainstream Engineering Corporation
5:00 PM - 6:30 PM	**SESSION 4E** **ID: Flow and Heat Transfer in Biological Systems-02** **Chair:** **Udit Sharma,** Tennessee Technological University	GWU Student Center, 3rd floor Room 310	56298 - Computational Study of Bristling Shark Denticle with Pulsed Inlet Velocity	Kent Gingerich Liberty University
			56366 - Baseline Computational Modeling of Healthy Lung Triple Bifurcation Geometry for Acute Respiratory Distress Syndrome (Ards, Covid Research)	Chinmay Rajesh Chavan Texas A&M University
			56271 - Analyzing the Pressure Distribution in the Upper Airway During Non-Invasive Respiratory Therapy	Robert Kacinski Liberty University
			55994 - Numerical Investigations of Force Coefficient Data for Tandem-Confined Flow Past Arrays of Cylinders	Breken Wallar Texas A&M University Engineering
			55896 - Prostate Cancer Focal Laser Ablation: Multi-Objective Optimization of the Treatment	Giovanni Napoli Università degli Studi del Molise
5:00 PM - 6:30 PM	**SESSION 4F** **ID: Experimental Methods/Tools in Fluid Mechanics and Heat/ Mass Transfer-02** **Chair:** **Marcello Iasiello,** Università degli Studi di Napoli Federico II	GWU Student Center, 3rd floor Room 311	56097 - Characteristics of Flow Operated by a Single Stage EHD Gas Pump	A K M Monayem Mazumder Saginaw Valley State University
			56243 - Measurement of Critical Point and Liquid-Vapor Saturation Curve of Sulfur Hexafluoride	Laura Almara University of North Texas
			57521 - Local Condensation Heat Transfer Measurements for External, Filmwise Condensation of R134a, R513A and R450A on a Smooth Tube	Michael Akinseloyin Kansas State University
			57534 - Achieving Narrower Solids Residence Time Distribution in Counter-Current Downer Reactor Compared to Co-Current: A PIV Study	Abdulrahman Alzailaie University of Wisconsin-Madison
			55933 - Measurement of Fluid Structure Strengthening in a Sandwich Core Composite Material	Ashok Ghosh New Mexico Tech
5:00 PM - 6:30 PM	**SESSION 4G** **TS: Material Issues, Ceramics, Low Thermal Conductivity** **Chair:** **Sai Guruprasad Jakkala,** Iowa State University	GWU Student Center, 4th floor Room 403	56190 - Investigations of Measurement Parameters on Thermal Conductivity and Heat Capacity of Expanded Polystyrene Insulation Materials using Heat-Flow-Meter and Transient Plane Sourc	Jae Hyun Kim Government
			56219 - Effect of Surrounding Media on the Thermal Properties of Two-Dimensional Van der Waals Heterostructures: A Molecular Dynamics Study	Titan Paul University of South Carolina Aiken
			56356 - A Numerical Simulation of Capillary Heat Pipes with Customized Phase Change Models	Min Chen Tsinghua University
6:30 PM - 7:00 PM	**Networking**	**GWU Student Center, 3rd floor**, Grand Ballroom and Hallway		

Wednesday — March 12, 2025

Time	Session	Room	Title	Author
8:00 AM - 10:00 AM	**Breakfast and coffee**	GWU Student Center, 3rd floor, Hallway		
8:00 AM - 8:15 AM	**Day 3 Announcements**	GWU Student Center, 3rd floor, Grand Ballroom	Welcome and Opening - **Kausik Sarkar,** George Washington University **Hamidreza Najafi**: Overview of Day 1, 2, and plan for Day 3 **Nesrin Ozalp**: Conference Tools, Venue and Events Announcement	
8:15 AM - 9:15 AM	**Plenary Lecture 3**	GWU Student Center, 3rd floor, Grand Ballroom	**Supercritical Fluids: An Enigma**	**Vishwanath Prasad** University of North Texas **Moderator:** **Kausik Sarkar** George Washington University
9:15 AM - 9:30 AM	**Break**			
9:30 AM - 10:45 AM	**PANEL 3** **Moderator:** **Pamela Norris** University of Delaware	GWU Student Center, 3rd floor, Grand Ballroom	**Strengthening the Thermal and Fluids Engineering Workforce: Challenges and Solutions**	**Pamela M. Norris** University of Delaware **Megan Leftwich** George Washington University **Leslie M. Phinney** Sandia National Labs
10:45 AM - 11:00 AM	**Break**			
11:00 AM	**Lab Tour by Michael Keidar**	Please meet 5 minutes before your tour near the conference registration desk. You will be greeted and a guide will escort you to the facility. You will need to walk 5 to 20 minutes to reach the laboratories		
		Science and Engineering Hall (SEH), 3rd floor, 3100	**Micropropulsion and Nanotechnology Laboratory** https://mpnl.seas.gwu.edu/	**Michael Keidar** A. James Clark Professor of Engineering, Department of Mechanical and Aerospace Engineering, GWU
Technical Session 5				
Morning SESSIONS				
11:00 AM - 12:30 PM	**SESSION 5A** **ES: Heat Pumps and Innovative Cooling and Heating Systems** **Chair:** **Mahyar Pourghasemi,** Western New England University	GWU Student Center, 3rd floor Room 301	55914 - Performance Evaluation of a District Energy Waste Heat Recovery System	Yong Tao, Olamide Opadokun Cleveland State University
			56055 - Transient Simulation of the Vapor-Compression Refrigeration Cycle for the Agricultural Cold Chain	Patrick Phelan Arizona State University
			57593 - Barocaloric Solid-State Heat Pumps: An Experimental Study	Bikram Bhatia University of Louisville
			56368 - Immersion Cooling in Data Centers: A Comprehensive Review of Benefits, Challenges, and Future Directions	Debjyoti Banerjee TAMU
			55819 - Particle Distribution in Nanofluids under the Influence of Temperature Gradient	Udit Sharma Tennessee Technological University
11:00 AM - 12:30 PM	**SESSION 5B** **ES: Sustainable Buildings and Cities** **Chair:** **Jonathan Maisonneuve,** Oakland University	GWU Student Center, 3rd floor Room 302	55684 - Evaluating the Economic and Environmental Impact of Flexible Fuel CCHP and Grid Peak Shaving for Data Centers	Taylor Stoll Colorado State University
			55934 - Enhancing Passive Daytime Radiative Cooling for Building Roofs Via Infrared-Transparent Pe Aerogels	Wenqi Wang City University of HongKong
			55952 - Thermal Dynamics Informed Building Design: Impact of Phase-Change Materials	Atul Bhargav IIT Gandhinagar
			56984 - Optimisation of Building Ventilation Networks for Better Health, Air Purity and Humidity Control	Artem Marie-Magdeleine Eta Tauri Ltd
			57561 - Enhanced Peak Load Identification with Practical EV Charging Schedule for Residential Buildings	Hohyun Lee San Jose State University
11:00 AM - 12:30 PM	**SESSION 5C** **ID: Fundamentals in Fluid Flow and Heat/Mass Transfer-03** **Chair:** **Patrick Mensah,** Southern University and A&M College	GWU Student Center, 3rd floor Room 307	56064 - Parametric Study on the Effect of Temperature Variation for Turbulent Rayleigh-Bénard Convection of Jovian Planets' Gases in a Cylindrical Enclosure	Patrick Mensah, Ebenezer Ashimolowo Southern University and A&M College
			56098 - Analysis of Heat Transfer by a Single Stage EHD Gas Pump	A K M Monayem Mazumder Saginaw Valley State University
			56338 - Experimental Study of Impact Dynamics of Paraffin Droplets on a Liquid Pool	Xili Duan Memorial University
			56389 - Humidity-driven Convection Patterns in a Horizontal Square Enclosure	Andy Damas California State University
			56020 - Isolating the Modes of Heat Transfer in Fibrous Insulation Materials	James Senig University of Kentucky

Time	Session	Room	Title	Author
11:00 AM - 12:30 PM	**SESSION 5D** **TS: Heat Pipes** **Chair:** **Huseyin Bostanci,** University of North Texas	GWU Student Center, 3rd floor Room 308	56076 - Analysis of Pulsating Heat Pipe as a Nonlinear Dynamical System	Suneet Singh IIT Bombay
			56239 - Experimental Characterization of Additively Manufactured Heat Pipes with Enhanced Evaporator and Condenser Sections	Alexander Rattner Pennsylvania State University Edward Hieb Raytheon
			56349 - Heat Pipe Principles for Moisture-Laden Exhaust Recovery	Helen Skop, Darrell Klammer Smart Heat Corporation Emilio Gudino Oakton Community College
			56027 - On Modeling of Complex Fluid Dispensing Systems	Dalong Gao GM R&D
11:00 AM - 12:30 PM	**SESSION 5E** **TS: Innovations in Heat Exchangers-02** **Chair:** **Sai Guruprasad Jakkala,** Iowa State University	GWU Student Center, 3rd floor Room 310	56009 - Using Surface Evolver to Simulate Pendant Droplet Behavior on Biphilic Patterned Surfaces for Condensation Heat Transfer Enhancement	Andrew Sommers Miami University
			56537 - Counter-current parallel-plate moving bed heat exchangers: Analytical solution via Integral Transforms	Pedro Isaza, Carlos Elorza Casas Solex Thermal Science
			57587 - Compliant Polymeric Sheet-Based Heat Exchangers	Richard Fontenot Rice University
			57723 - Additively Manufactured Dual Manifold Heat Exchanger	Sumner Gubisch The George Washington University
11:00 AM - 12:30 PM	**SESSION 5F** **TS: Heat/Mass Transfer Enhancement Techniques-03** **Chair:** **David Hwang,** Stony Brook University	GWU Student Center, 3rd floor Room 311	56056 - Numerical Optimization of Helically Coiled Tube Heat Exchangers using Artificial Neural Networks: Predicting Optimal Pitch for Enhanced Heat Transfer Efficiency	Hessam Mirgolbabaei University of Minnesota
			56059 - Comparative Analysis of Humidification Capacity with Different Packing Materials in Crossflow Humidification-Dehumidification Systems	Raghav Bihani Michigan State University
			56238 - Enhancing Heat Transfer and Evaporation Control through Bubble Dynamics and Surfactants	Birce Dikici ERAU
			56631 - Enhanced Heat Transfer in Natural Convection by Means of Liquid Metals and Partitioned Domains	Joel Smith Northrop Grumman
11:00 AM - 12:30 PM	**SESSION 5G** **ES: Hydrogen Energy Systems** **Chair:** **Titan Paul,** University of South Carolina Aiken	GWU Student Center, 4th floor Room 403	55953 - Simulation of an Active and Bidirectional Thermochemical Temperature Control Unit Utilizing Metal Hydrides	Hanna Lösch German Aerospace Center
			55970 - Enabling Chemical Storage of Hydrogen for Fuel Cell UAV Applications: Hydrogen Generator Design and Performance	Atul Bhargav IIT Gandhinagar
			56008 - High-Pressure Metal Hydride Hydrogen Compression	Ketan Karkare Michigan Technological University
12:30 PM - 12:45 PM	**Break**			
12:45 PM - 1:45 PM	**Lunch and Invited Luncheon Talk**	GWU Student Center, 3rd floor, Grand Ballroom	**A Numerical Study of the Metal Foam Thickness Effect on Impinging Round Jets in Channel Partially Filled with Metal Foam**	**Gerardo Maria Mauro** Università degli Studi di Napoli Federico II **Moderator:** **Wilson Chiu** University of Connecticut
1:45 PM - 2:00 PM	**Break**			
2:00 PM - 3:00 PM	**Closing ceremony**	GWU Student Center, 3rd floor, Grand Ballroom	**Pamela Norris**: Overview and closure; **Yong Tao**, *ASTFE Past President*: Closure and Draw Prize Raffle; **Nesrin Ozalp**: Closure; **Hamidreza Najafi**: Closure.	

THANKS TO OUR EXHIBITORS AND SPONSORS

Friday — March 14, 2025

Time	Session	Title	Author
10:00 AM - 10:30 AM	**Day 4 Announcements**		
Virtual Session 1			
Morning SESSIONS			
10:30 AM - 12:30 PM	**SESSION V-1A** **ES: Alternative Energy Conversion Systems (Wind, Biomass, Nuclear, etc.)** **Chair:** **Mariana Migliori,** Florida Institute of Technology	55938 - Investigation of Thermal Characteristic of Biomass for Energy Utilization Through Differential Scanning Calorimetry	Sadiq Abdullahi Waziri IIT Ropar
		55858 - Thermal Interaction of Geothermal Boreholes with Groundwater Flows at Peclet Numbers of Order Unity	Miguel Hermanns Universidad Politécnica de Madrid
		57386 - Cost and Quality Thresholds for Biomass Supply in Biomass-Agnostic Biorefineries	Nawa Baral Lawrence Berkeley National Laboratory
		55682 - Computation Fluid Dynamics Analysis for Generic Small Modular Reactor Containment Separate Effects Test	Grant Hendrickson Oregon State University
		55517 - Extending Deep Learning U-Net Architecture for Predicting Fluid Flows in Textured Microchannels	Ganesh Sahadeo Meshram IIT Kharagpur
		55984 - Combined Effect Of Surface Coating And Surfactant Additive On Pool Boiling Heat Transfer	Rajesh Kumar IIT Delhi
10:30 AM - 12:30 PM	**SESSION V-1B** **ID: Experimental Methods/Tools in Fluid Mechanics and Heat/Mass Transfer** **Chair:** **Sunil Kumar,** Texas A&M University	56029 - Rapid Temperature Measurement During Gas Decompression in Partial Vacuum Conditions	Asif Khan CREST
		55990 - Alternative Fuel Spray Characterization using Rainbow Schlieren Deflectometry	Mebougna Drabo Alabama A&M University
		56012 - Spray Characterization of Citral Biodiesel using Rainbow Schlieren Deflectometry	Mebougna Drabo Alabama A&M University
		54929 - Experimental Analysis of Stepped Hulls' Impact on Monohull High-Speed Craft Performance and Longitudinal Stability	Anthony Adeyanju The University of the West Indies
		55674 - Development and Design of a Complete Environmental Control Systemfor Executive Light Transport Aircraft	Giulio Malinverno FIMAC SpA
		56002 - Rapid Testing and Performance Improvement of a Portable Desalination System Powered by Renewable-Energy	Nael Barakat University of Texas at Tyler
10:30 AM - 12:30 PM	**SESSION V-1C** **TS: Electronics Cooling and Heat/ Mass Transfer Enhancement Techniques** **Chair:** **Benjamin Kubwimana,** NVIDIA	55838 - Thermal Characterization of Bolt Mounting Region of a Multi-Layer Board and Validation Through Numerical Approach	Nikhil R URSC-ISRO
		55989 - Numerical Optimization of Thermal and Hydrodynamic Performance of a Parallel Microchannel Heat Sink	Md Motiur Rahaman IIT Madras
		56480 - Enhancing Staggered Parallel Plate-Fin Heat Sinks for Efficient Thermal Management in MOSFET Cooling	Abdelmounaim DADDA Mohammed V University in Rabat
		55077 - Optimizing Sinusoidal Inserts with Alternating Axis using Taguchi Method: a Numerical Approach	Mehrdad Poursadegh University of Nebraska-Lincoln
		56183 - The Influence of Anisotropy and Viscous Dissipation on the Flow Dynamics and Thermal Transfer within a Fluid-Saturated Porous Medium in the Developing Region	Rishav Aich National Institute of Technology, Warangal
		57402 - Experimental Study on Heat Transport Characteristics of Flat Plate Heat Pipe with Meandering Channel Composed of Porous Sidewalls	Kizuku Kurose Yokohama National University
10:30 AM - 12:30 PM	**SESSION V-1D** **FD: Multiphase Flows** **Chair:** **Haiwen Ge,** Virtual Thermal Fluids, LLC	55870 - A Criteria for Determining the Transition Between the Homogeneous and the Heterogeneous Flow Regimes in Two-Phase Bubble Columns	Andrea Ferrario Politecnico di Milano
		55875 - Flow Structure Characterization by Image Analysis on Pool Scrubbing under Globular and Jet Injection Regime	Nicolò Varallo Politecnico di Milano
		55912 - Characterization of the Developing Region of Vertical Upward Two-Phase Flow for Co-Flowing Streams	Ivan Nepomnyashchikh Oregon State University
		55992 - Numerical Studies on Spreading and Heat Transfer Characteristics During Drop Impingement over Patterned Surface	Rahul Sharma IIT Madras
		55840 - Numerical Investigation on the Effect of Liquid-to-Gas Density Ratio on Secondary Droplet Atomization for a Pressure Swirl Atomizer	Keerthi Santhosh Kumar IIT Hyderabad
		56158 - An Investigation of Linear Stability in a Fluid-Saturated Darcy-Brinkman Model on Casson Fluid Involving Anisotropy Thermal Diffusivity	Anil Kumar National Institute of Technology Warangal

Time	Session	Title	Author
10:30 AM - 12:30 PM	**SESSION V-1E** **ID: Fundamentals in Fluid Flow and Heat/Mass Transfer-01** **Chair:** **Graham Thorpe,** Victoria University	55545 - Conduction Shape Factor for a Set of Parallel Isothermal Cylinders in an Infinite Domain	Lisa Steigerwalt Lam Wingate Thermal Energy
		56422 - The Influence of Psychrometric Properties on the Drying of Hygroscopic Porous Media	Graham Thorpe Victoria University
		57431 - Effects of Boundary Temperature Ratio on Fluid Flow and Heat Transfer in a 2D Square Cavity with Radiative Participating Media	Ben-Wen Li Dalian University of Technology
		57124 - Shell and Tube Heat Exchangers in Biopharmaceutical Applications in Meeting Purity and Regulatory Standards	Joshua Mendez Texas A&M University
		55831 - Distributed Renewable Power Generation using Thermodynamic Cycles: Options and Challenges	Mayank Srivastava IIT (BHU) Varanasi
		56176 - Numerical Study on Particle Deposition Characteristics in Radial Pre-Swirl System	Jia-Lin Peng Nanjing University of Aeronautics and Astronautics
10:30 AM - 12:30 PM	**SESSION V-1F** **FD: Turbulent Flows** **Chair:** **Nima Nadim,** Curtin University	55647 - Utility Van Aerodynamics: Flow Field and Pressure Drag	Miracle Andrew Southern Illinois University Edwardsville
		56223 - Combined Methods of Turbulent Flow Control Using Artificial Generation of Near-Wall Vorticity	Yevhenii Shkvar College of Engineering at Zhejiang Normal University
		55864 - Influence of Carbon Nanotubes on Biodiesel Derived from Manilkara Sapota Seed Oil Fuelled in Diesel Engine on Performance and Emission Characteristics – an Experimental Approach	Ravishankar Sathyamurthy KFUPM
		56004 - Dynamics of Enstrophy and Turbulent Kinetic Energy in Turbulent Premixed Flames at High Pressure	Karla Coronado The University of Tennessee at Chattanooga
		55958 - Inverse Method for Reconstruction of Local Scalar Properties in Turbulent Flows from Line-Of-Sight Measurements	Thomas Soworka German Aerospace Center (DLR), Institute of Propulsion Technology
		56057 - Combined Streamwise/Streamline Pressure Gradient Effects on Turbulent Wall-Bounded Flows with Passive Scalar Transport	David Paeres Castano CTVLab at UTSA
10:30 AM - 12:30 PM	**SESSION V-1G** **ES: Thermal Management of Energy Systems-01** **Chair:** **Muzammil Arshad,** University of Washington	55999 - Utilizing an Auxiliary Cycle for Controlling High Return Water Temperature in Transcritical CO2 Heat Pumps	Ebraheem Alanazy, Zhibin YU The University of Liverpool
		55906 - Abstract: Schroder Paradox is understood	Nicholas Ingarra Oakland University
		55908 - Understanding the Physics of the Microporous Layer in PEM fuel cells	Nicholas Ingarra Oakland University
		56367 - Baseline Computational Modeling of Healthy Lung Triple Bifurcation Geometry for Acute Respiratory Distress Syndrome (ARDS, COVID Research)	Asma Zainab Houston Methodist Hospital
		56365 - Experimental Investigation of Micro/Nano-Scale Transport Phenomena During Droplet Evaporation for Energy Applications	Jonghyun Lee Texas A&M University
		55821 - Multidisciplinary Project Based Learning (multi-PBL) for a Single Combined Project in Two Core Mechanical & Aerospace Engineering Courses for Enhanced Student Engagement	Muzammil Arshad University of Washington
12:30 PM - 1:00 PM	Break		
Afternoon SESSIONS			
1:00 PM - 3:00 PM	**SESSION V-2A** **ES: Energy Storage Systems** **Chair:** **Khalil Khanafer,** University of Michigan - Flint	55272 - Numerical Analysis of Enhanced Thermal Management for Supercapacitors Using Phase Change Materials	Khalil Khanafer University of Michigan - Flint
		55445 - Numerical Investigation of Charge Transfer Incorporating Temperature in Supercapacitors: Insights into Self-Discharge Mechanisms	Muhammad Rahman AFIT
		56031 - Temperature Driven Capacity Changes in LiSi / LiCl-KCl / FeS2 Thermal Reserve Battery Cells Over a Range of Separator Pellet Thicknesses and Temperatures	Ken Blecker CCDC-AC
		56388 - Numerical Analysis of Irreversibility in a Solar Latent Heat Thermal Energy Storage System using the Second Law of Thermodynamics	Raymond Ojonugwa Ikeleji University of Cape Town
		56051 - Renewable Marine-Source Integrated Heat Pump for Space Conditioning, Water Heating, and Fresh Water Harvesting in Remote Coastal and Island Communities	Zhiming Gao Oak Ridge National Laboratory
		56640 - The Role of Advanced Thermal Energy Storage Technology for the Renewable Energy Era	Jianlei Niu The Hong Kong Polytechnic University
1:00 PM - 3:00 PM	**SESSION V-2B** **ES: Thermal Management of Energy Systems-02 correspondingly** **Chair:** **Sunil Kumar,** Texas A&M University	55967 - Design and Analysis of an Embedded Dual Channel Cooling Structure for an Axial Flux Permanent Magnet Synchronous Motor	Jonathan Hey Agency for Science Technology and Research Singapore
		56558 - Hybrid Evaporative Cooling System for EV's Batteries	Obaidallah Munteshari KFUPM
		55911 - Thermal Management of Pouch Cells at High Ambient Temperatures using Graphene nanofluid through a T-shaped Cold Plate	Hemanth Dileep IIT Madras
		55768 - Investigation of Thermohydraulic Performance of Polymer-based Hybrid Cooling Plates	Muhammad Azeem Ghouri University of Houston
		57588 - Correlating Bubble Dynamics and Heat Transfer in Fluidized Bed Heat Exchangers using Convoluted Neural Networks	Julio Izquierdo University of Louisville
		56189 - Calculating the Effects of Solids Input and Removal as a Temperature Control in the Advanced Scale Up Reactor Experiment (ASURE) Facility at NETL Using Aspen	John Vanosdol USDOE/NETL

Time	Session	Title	Author
1:00 PM - 3:00 PM	**SESSION V-2C** **ID: Computational Methods/Tools in Thermal-Fluid Systems** **Chair:** **Emel Selamet,** The Ohio State University	55326 - Empirical and Analytical Eigenfunctions as Bases for Reduced Order Methods in Heat Transfer	Jakob Bates Brigham Young University
		55628 - Mass, Momentum, and Energy Source Treatment in Computational Fluid Dynamics Models	Laurie Florio US ARMY DEVCOM AC
		55629 - Phase Change and Chemical Reactions with Discretized Particle Agglomerates	Laurie Florio US ARMY DEVCOM AC
		55666 - Quantum Computing CFD Simulations: Review and State of the Art	Giulio Malinverno FIMAC SpA
		56233 - Effect of Hartmann number on Natural Convection Heat Transfer in a Cross-Shaped Enclosure Heated Below	Emel Selamet OSU
		56663 - Reduced Order Thermal Model for rapid Calculations of Maximum LED temperature for Lighting Applications	Mukesh Gupta Eaton Technologies Private Limited
1:00 PM - 3:00 PM	**SESSION V-2D** **TS: Heat Transfer in Multiphase Flows** **Chair:** **Nima Nadim,** Curtin University	55975 - Numerical Investigation of the Influence of Liquid Feeder System and Vapour Flow Paths on the Falling Film Evaporation of Water on a Horizontal Tube Bundle	Sateesh Gedupudi IIT Madras
		57441 - A Novel Cooling Design for Thermal Management of an Electric Motor using Jet Impingement	Zia Ud Din Taj University of Windsor, Canada
		57671 - Accelerating PCM Heat Transfer Simulations for Thermal Energy Storage Systems Using Lattice Boltzmann Method Coupled with Bayesian Networks	Dongyu Chen Shanghai Jiao Tong University
		56153 - Experimental Analysis of Stability and Viscosity of TiO2 and MWCNT Nanofluids with EG and Water Basefluids	Hnan Alshehemah Kuwait University, College of Engineering and Petroleum
		56602 - Electrokinetic Energy Conversion at Low Ionic Strength	Austin Dick Stony Brook University
		56215 - Dimensionless Regime Mapping and Chaos Analysis of Solids Volume Fraction Data in a Circulating Fluidized Bed Riser	Steven Rowan USDOE/NETL
1:00 PM - 3:00 PM	**SESSION V-2E** **ID: Fluid Flow and Heat Transfer in Industrial and Commercial Processes** **Chair:** **Mahyar Abedi,** Oregon State University	55842 - How can CFD Accelerate Plasma-Synthesis of Magnetic Powder for Clean Energy Applications?	Morteza Javid National Research Council
		56385 - Non-Newtonian Semi-2D Model for Pipeline Wax Deposition	Samuel Candido Pontifical Catholic University of Rio de Janeiro
		57034 - Analysis for Binary Non-Equilibium Critical Chocking Flow Characteristcs in Steam Discharging Process of Steam Generator System	Yong Yang Dalian University of Technology
		56075 - Simulation of Stress and Deformation of Variable Cross Section Components During the Direct Energy Deposition (DED) Process	Ibrahim Tansel Oregon State University
		55910 - Multi-Objective Bayesian Method for Enhanced HDH System Design	Mahyar Abedi Oregon State University
		56049 - Compressibility Effect on Pod Modes Over Zero-Pressure Gradient Flat Plate Turbulent Boundary Layers	Subhajit Roy The University of Texas at San Antonio
1:00 PM - 3:00 PM	**SESSION V-2F** **ID: Fundamentals in Fluid Flow and Heat/Mass Transfer-02** **Chair:** **Jonathan Maisonneuve,** Oakland University	56729 - Direct Numerical Simulations of Turbulence-Cloud-Aerosol Interactions in Atmospheric Clouds	Foluso Ladeinde Stony Brook University
		56735 - Large Eddy Simulation Modeling of Heat Flux in a Rotational Detonation Engine	Foluso Ladeinde Stony Brook University
		56188 - Thermal and Hydraulic Performance of Plain Tube Equipped with Twisted Tape Inserts and Fe2O3 Nanofluid	Hafiz Muhammad Ali King Fahd University of Petroleum and Minerals
		56228 - Effects of Gas Rarefaction and Wall Cooling Condition in Hypersonic Boundary Layers	Christian Lagares University of Texas
		55944 - A Coupled 2D Thermo-Mechanical Analysis for the Estimation of Thermal Contact Conductance in Conforming Rough Metal Contacts Using Recreated Measured Surface Profile	Ajul E IIT Palakkad
		56018 - Analysis of an Energy Efficient Hybrid Air Conditioning System Based on Low GWP Refrigerants	Sobiya Maqbool IIT Kharagpur
3:00 PM - 3:30 PM	**Closing**		

ASTFE

American Society of Thermal and Fluids Engineers

11TH THERMAL AND FLUIDS ENGINEERING CONFERENCE (Hybrid)

9-12 MARCH 2026

In person at Arizona State University, Tempe, AZ, USA
And partially online virtual via Zoom and Whova

www.astfe.org/tfec2026/

The American Society of Thermal and Fluids Engineers (ASTFE), TFEC2026 Conference (Hybrid) will be held March 9-12, 2026 in person at Arizona State University, AZ, USA and partially online virtual. ASTFE is the premier international society by and for professionals within the thermal and fluids science and engineering community. The 11th ASTFE conference, TFEC2026 provides an international forum for the dissemination of the latest research and knowledge in the thermal and fluid sciences. Authors are invited to submit abstracts covering, but not limited to, the following areas:

Track 1: Thermal Science
- TS: Aerospace Applications
- TS: Heat Pipes
- TS: Innovations in Heat Exchangers
- TS: Combustion, Fire and Fuels
- TS: Electronics Cooling
- TS: Heat Transfer in Multiphase Flows
- TS: Flow and Heat Transfer in Materials Processing Science and Manufacturing
- TS: Heat/Mass Transfer Enhancement Techniques
- TS: Material Issues, Ceramics, Low Thermal Conductivity
- TS: Radiation Heat Transfer
- TS: Inverse Problems and Parameter Estimation in Heat Transfer

Track 2: Fluid Dynamics
- FD: Atomization
- FD: Flow Instability
- FD: Rheology of Nonlinear Materials and Complex Fluids
- FD: Measurement and Modeling of Environmental Flows
- FD: Multiphase Flows
- FD: Nano and Micro Fluids Applications
- FD: Turbulent Flows
- FD: Aerodynamic Design and Analysis
- FD: Turbomachinery
- FD: Thin Film Fluid Phenomena

Track 3: Interdisiplinary Studies
- ID: Experimental Methods/Tools in Fluid Mechanics and Heat/Mass Transfer
- ID: Computational Methods/Tools in Thermal-Fluid Systems
- ID: Machine Learning and Artificial Intelligence in Thermo-Fluid Engineering
- ID: Fundamentals in Fluid Flow and Heat/Mass Transfer
- ID: Flow and Heat Transfer in Biological Systems
- ID: Fluid Flow and Heat Transfer in Industrial and Commercial Processes
- ID: Electric, Magnetic, Flow and Thermal Phenomena in Micro and Nano-Scale Systems

Track 4: Energy and Sustainability
- ES: Carbon Capture and Sequestrations
- ES: Heat Pumps and Innovative Cooling and Heating Systems
- ES: Sustainable Buildings and Cities
- ES: Alternative Energy Conversion Systems (Wind, Biomass, etc.)
- ES: Energy Storage Systems
- ES: Hydrogen Energy Systems
- ES: Solar Energy Equipment and Processes
- ES: Innovative Refrigeration Systems
- ES: Nuclear Energy Systems
- ES: Energy-Water-Food Nexus
- ES: Novel Thermodynamic Cycles
- ES: Thermal management of Energy Systems

Track 5: Educations and Ethics
- EE: Advanements in Thermo-Fluids Education
- EE: Ethics in Thermo-Fluid Engineering
- EE: Innovations in Capstone Projects

Track 6: Competitions and Special Conference Program Elements
- Nuclear Thermal Hydraulic CFD Competition
- Students Poster Session
- Students Projects: IRES

Authors will have options to present their research work as presentation only, extended abstract (maximum of 4 pages), or full-length paper (5-10 pages). The conference proceedings will contain both peer-reviewed extended abstracts and papers, and will be distributed in a digital form, the ASTFE Digital Library. Authors will also have the option to submit their full conference papers to a technical journal of their choice after the conference. The full conference papers should have significant changes made before submitting to any journals. The same full conference papers cannot be submitted to any journal publications. Authors may share their original manuscripts with the public but must include a citation and a link to the published paper (conference paper or journal paper).

SUBMIT YOUR PAPER ABSTRACT BY SEPTEMBER 6TH, 2025 TO: http://submission.astfe.org

Please check http://astfe.org/tfec2026/ regularly for conference updates or contact any member of the organizing committee for further inquiries.

DEADLINES

September 6, 2025
Abstract Due

September 13, 2025
Notification of Abstract Accept / Decline

October 11, 2025
Draft Paper / Extended Abstract Due

November 8, 2025
Draft Paper / Extended Abstract Reviews Completed

November 15, 2025
Authors Notified of Paper / Abstract Status

November 22, 2025
Revised Manuscript Due

December 6, 2025
Presentations Only Abstracts Deadline / Final Paper / Extended Abstract Due

ORGANIZING COMMITTEE

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Conference Program

10TH THERMAL AND FLUIDS ENGINEERING CONFERENCE (HYBRID)

March 9-12, 2025

www.astfe.org/tfec2025/

UPCOMING CONFERENCES

11th International Symposium on Radiative Transfer, RAD-25

Kuşadasi, Türkiye
June 15-20, 2025

11th International Symposium on Turbulence, Heat and Mass Transfer, THMT-25

Tokyo, Japan
July 21-25, 2025

International Symposium on Low-Carbon Thermal Energy Science And Technology, LCET-2025

Istanbul, Turkiye
October 15-17, 2025

11th Thermal and Fluids Engineering Conference (Hybrid)

Arizona State University, Tempe, AZ, USA
March 9-12, 2026

18th International Heat Transfer Conference

Rio de Janeiro, Brazil
August 10 – 15, 2026

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