The 9 th Asian Symposium on
Computational Heat Transfer and Fluid Flow-2023

Program

(ASCHT2023)

December 4-6, 2023
Thuwal, Saudi Arabia

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Welcome

Dear Sir/Madam,

Under the guidance of Professor Kazuhiko Suga (Osaka Metropolitan University, Japan), Professor Gihun Son (Sogang University, Korea) and Professor Gui-Hua Tang (Xi'an Jiaotong University, China), with the help of Prof. Liang Gong (China University of Petroleum (East China), China), Prof. Hong G. Im and I have been honored to host the 9th Asian Symposium on Computational Heat Transfer and Fluid Flow (ASCHT2023). It is my great pleasure in welcoming you to attend this important event in King Abdullah Economic City, Saudi Arabia (December 4-6, 2023). We would like to thank all the special guests, invited speakers and sponsors for their generous support.

This conference aims to provide a common forum to exchange new ideas and creations in recent advances on heat transfer and fluid flow theories, analyses, and applications of computational methods. The attendees are prestigious scientists and engineers from Asia as well as other parts of the globe, who work closely on algorithms and applications in theoretical and engineering thermo-fluid science. It is anticipated that ASCHT2023 will provide an opportunity to stimulate further research and collaborations among the investigators in the field of thermo-fluid science and engineering.

There are 21 sessions and 2 special sessions in the ASCHT2023, containing 4 plenary lectures, 11 keynote lectures, 31 invited talks, 131 oral presentations. These sessions cover extensive themes, including energy and environment, flow and heat transfer control, heat and mass transfer in porous media, computational heat transfer and fluid dynamics, industrial heat transfer and fluid flow, multi-scale simulation of heat transfer and mass transfer, advances in geo-energy research and many others. Special issues of selected articles presented in the ASCHT2023 will be published in a number of international journals, including *Applied Thermal Engineering, Gas Science and Engineering, Computational Geosciences, Membranes, Advances in Geo-Energy Research*.

On behalf of the ASCHT2023 committee, I sincerely appreciate your participation in the conference. We will devote every effort to making ASCHT2023 an outstanding platform for academic exchange.

I wish you all a successful and beneficial meeting!

Sincerely yours,

Shuyu Sun

Professor, King Abdullah University of Science and Technology
on behalf of the Local Organizing Committee

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Important Information

On-site Registration

Date	*Time*	*Location*
Dec. 03, 2023	14:00-20:00	Bay La Sun Hotel
Dec. 04, 2023	08:00-21:00	Bay La Sun Hotel
Dec. 05, 2023	08:00-18:00	Bay La Sun Hotel
Dec. 06, 2023	08:00-12:00	Bay La Sun Hotel

Banquet

December 4th, 19:00-21:00 (Saudi Time), Banquet Hall, Bay La Sun Hotel

Award

The best papers and other honors & awards will be selected for recognition in the Award Ceremony, during the Banquet.

Venue

Date	*Location*
Dec. 04, 2023	Banquet Hall
Dec. 05, 2023	Marina Room, Talah Room, Almurooj Auditorium
Dec. 06, 2023	Marina Room, Talah Room, Almurooj Auditorium

The online participants may join virtually via Zoom meeting. The meeting ID for each session is listed in the Agenda Overview and Conference Program.

Contact

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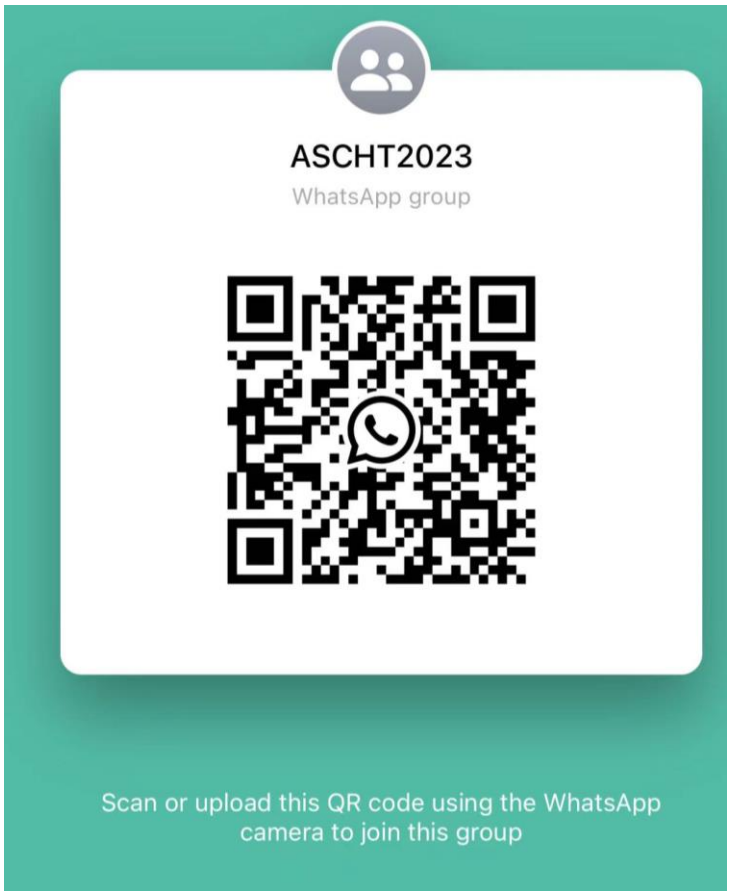
The current QR code for the WhatsApp Group and Wechat Group of our conference is attached below. We may update the QR every week, announced via both the email and conference website.



QR for WhatsApp Group

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Agenda Overview

Day 1: December 4th, 2023 (Saudi Time)

08:00-08:30	Opening Ceremony, Banquet Room, Meeting ID 8894070666
Plenary Lecture Session, Banquet Room, Meeting ID: 8894070666 Chair: Hong G. Im	
08:30-09:15	Algebraic Non-Equilibrium Wall Modelling for Large Eddy Simulation **Kazuhiko Suga** (Osaka Metropolitan University, Japan)
09:15-10:00	Computational bubble/droplet dynamics and applications **Gihun Son** (Sogang University, South Korea)
10:00-10:30	Coffee Break
10:30-11:15	Robust and Efficient Modeling of Two-Phase Flow: From Sharp Interface to Diffusive Interface Models, and from Mesh-Based to Mesh-Free Methods **Shuyu Sun** (King Abdullah University of Science and Technology, Saudi Arabia)
11:15-12:00	Nanoporous aerogel for high-temperature thermal insulation and solar energy harvesting **Guihua Tang** (Xi'an Jiaotong University, China)
Buffet Lunch	
Keynote Lecture Sessions, Banquet Room, Meeting ID: 8894070666 Chairs: Shuyu Sun & Gihun Son	
14:00-16:00	Keynote Lectures
16:00-16:30	Coffee Break
16:30-18:00	Keynote Lectures
19:00-21:00	Banquet (Award Ceremony)

Day 2: December 5th, 2023 (Saudi Time)

Room	Marina Room Meeting ID: 8894070666	Talah Room, Meeting ID: 7943441949	Almurooj Auditorium, Meeting ID: 6170704786
08:00-09:50	Session 3: Special Topic Modeling, Simulation, Energy and Environment -1 Chair: **Shuyu Sun**	Session 5: Computational heat transfer and fluid dynamics -1 Chair: **Jaiyoung Ryu**	Session 7: Industrial heat transfer and fluid flow -1 Chair: **Xiaole Li**
09:50-10:20	Coffee Break		
10:20-12:00	Session 4: Special Topic Modeling, Simulation, Energy and Environment -2 Chair: **Kazuhiko Suga**	Session 6: Computational heat transfer and fluid dynamics -2 Chair: **Xinlei Liu**	Session 8: Industrial heat transfer and fluid flow -2 Chair: **Hu Zhang**
	Buffet Lunch		
14:00-15:55	Session 9: Flow and heat transfer control -1 Chair: **Liang Gong**	Session 11:Heat and mass transfer in porous media -1 Chair: **Jianchao Cai**	Session 13:Multi-scale simulation of heat transfer and mass transfer -1 Chair: **Xiaole Li**
15:55-16:25	Coffee Break		
16:25-18:00	Session 10: Flow and heat transfer control -2 Chair: **Hiroshi Iwai**	Session 12: Heat and mass transfer in porous media -1 Chair: **Jingfa Li**	Session 14:Multi-scale simulation of heat transfer and mass transfer -2 Chair: **Daobing Wang**

Day 3: December 6th, 2023 (Saudi Time)

Room	Marina Room Meeting ID: 8894070666	Talah Room, Meeting ID: 7943441949	Almurooj Auditorium, Meeting ID: 6170704786
08:00-09:55	Session 15: AGER Special Session – Advances in Geo-Energy Research -1 Chair: **Shuyu Sun**	Session 17: Flow and heat transfer control -3 Chair: **Jingfa Li**	Session 19: Industrial heat transfer and fluid flow -3 Chair: **Junjun Guo**
09:55-10:25	Coffee Break		
10:25-12:00	Session 16: AGER Special Session – Advances in Geo-Energy Research -2 Chair: **Long Ju**	Session 18: Flow and heat transfer control -4 Chair: **Wentao Ji**	Session20: Industrial heat transfer and fluid flow -4 Chair: **Pu He**
	Buffet Lunch		
14:00-16:40	Session 21: Miscellaneous subjects -1 Chair: **Fan Bai**	Session 22: Miscellaneous subjects -2 Chair: **Daobing Wang**	Session 23: Miscellaneous subjects -3 Chair: **Yutong Mu**

Plenary Lectures

Professor
Kazuhiko Suga
Osaka Metropolitan University (Japan)

Biography:

Kazuhiko Suga received his B.Eng. and M. Eng. degrees in Mechanical Engineering from Kyoto University, Japan in 1983 and 1985, respectively. He then joined Toyota Central Research & Development Labs. in 1985. He was awarded a Ph.D. degree from the University of Manchester Institute of Science & Technology, UK, in 1996. He was also awarded a higher doctorate degree: D.Sc., from the University of Manchester, UK, in 2021. Since 2006, Dr. Suga has been a Professor of the Department of Mechanical Engineering at Osaka Prefecture University (whose name was changed to Osaka Metropolitan University in 2022), Japan. His research interests include turbulent heat transfer and micro-scale fluid flows. On those topics, he published more than 160 refereed papers. For his research achievements, he received many awards such as Best Research Award, from The Heat Transfer Society of Japan, 2006; Fluid Mechanics Award, from The Japan Society of Fluid Mechanics, 2007; The Commendation for Science and Technology, from the MEXT Japan; 2008; Fluids Engineering Award, from The Japan Society of Mechanical Engineers Fluids Engineering Division, 2018 and Fellow of Asian Union of Thermal Science and Engineering, 2023. He now serves as the co-Chairs of the ASCHT and THMT (Turbulence, Heat and Mass Transfer) conferences. He has also served as the president of the Japan Society of Fluid Mechanics (2022-2023) and as an associate editor/editor/editor-in-chief of several international journals including International Journal of Heat and Fluid Flow, Fluid Dynamics Research, Heat Transfer Research, Journal of Fluid Science and Technology, etc.

Algebraic Non-Equilibrium Wall Modelling for Large Eddy Simulation

Abstract:

Algebraic nonequilibrium wall-stress modelling for large eddy simulation is discussed. The ordinary differential equations (ODEs) derived from the approximated turbulent momentum and energy equations, including the temporal, convection, and pressure gradient terms, are analytically integrated to form the wall-stress and heat-flux models. In the present study, the profiles of the subgrid-scale (SGS) eddy viscosity and the temperature-dependent fluid viscosity inside the wall-adjacent cells are modelled as two-segment low-order variations to make it possible to integrate the ODEs analytically. By applying such integration to all the velocity components and temperature, this methodology gives the time-dependent wall boundary conditions for the velocity components and temperature and the resultant LES data are confirmed to be good enough in turbulent channel flows with and without variable viscosity. The data also show the model's insensitivity to the grid resolutions.

Professor
Gihun Son
Sogang University (South Korea)

Biography:

Prof. Gihun Son received his B.S. and M.S. in Mechanical Engineering from Seoul National University in 1986 and 1988, respectively, and his Ph.D. from UCLA in 1996. He joined Sogang University in 2000 after working at UCLA and Korea Electric Power Reseach Institute. His research interests include computational multiphase flows, heat transfer and power plant simulation. He served as vice president of the Korean Society of Mechanical Engineers (KSME) in 2020-2021 and as president of Korean Society for Computational Fluids Engieering (KSCFE) in 2021. He is currently the ediotr-in-chief of the KSCFE journal.

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Computational bubble/droplet dynamics and applications

Abstract:

Numerical approaches are presented for computation of multiphase flows including bubbles and droplets, which are observed in various applications such as boiling, inkjet pattering, hydrodynamic erosion, ultrasonic cleaning, medical treatment and water treatment. A level-set (LS) method was developed for analysis of bubble and droplet dynamics including the effect of surface tension and phase change. It was applied to bubble dynamics associated with film/nucleate boiling in pool and microchannel conditions with structured surfaces and to droplet dynamics in inkjet, droplet evaporation and dip coating. The LS method was further extended to include the ghost-fluid and semi-implicit pressure correction methods and the full Eulerian method for compressible two-phase flows and solid deformation. It was applied to acoustic cavitation and droplet vaporization near rigid/deformable walls including the interactions between the liquid-vapor, liquid-liquid and fluid-solid interfaces.

Professor
Shuyu Sun
King Abdullah University of Science and Technology
(Saudi Arabia)

Biography:

Shuyu Sun is a founding Professor of Earth Science and Engineering at King Abdullah University of Science and Technology (KAUST); he is also jointly affiliated with the Program of Applied Mathematics and Computational Science and the Program of Energy Resource and Petroleum Engineering at KAUST. He obtained his Ph.D. degree in computational and applied mathematics from The University of Texas at Austin in 2003. He has published 360+ refereed journal articles, plus numerous conference papers and technical reports as well as a few book chapters. Based on Google Scholar, his total citation number (as of Nov 2023) is 9784 with a h-index of 49. He has 4 papers recognized as "Highly Cited in Field in Web of Science", and recently he published a book with Elsevier entitled "Reservoir Simulation: Machine Learning and Modeling". Currently he is the president of InterPore (International Society for Porous Media) Saudi Chapter. He is also an editorial board member for Computational Geoscience, Gas Science and Engineering, and Journal of Computational Physics, three top journals in his field.

Robust and Efficient Modeling of Two-Phase Flow: From Sharp Interface to Diffusive Interface Models, and from Mesh-Based to Mesh-Free Methods

Abstract:

Two-phase flow has widely used in mechanical, geo-energy and environment applications. For example, its recent applications in pore-scale two-phase systems are considered as one of the key contributions to the success of digital rock technology. In this talk, we will review the development of two-phase flow modeling and simulation techniques from the sharp Interface models to various diffusive interface models; we will also review mesh-based methods including finite difference methods, finite element methods, finite volume methods, and Lattice Boltzmann methods as well as particles-based mesh-free methods. The highlight of this talk is to report our recent work applying the Smoothed Particle Hydrodynamics (SPH) method, a particles-based mesh-free method, to solve the incompressible two-phase fluid flow modeled by the Navier–Stokes–Cahn–Hilliard system of equations. In this work, a novel, efficient and unconditionally energy-stable SPH method is proposed and implemented for the two-phase flow. The idea behind the decoupling scheme is to simplify the calculation into a few linear steps while still maintaining unconditional energy stability. We prove that our SPH method inherits mass and momentum conservation and the energy dissipation properties from the PDE level to the ODE level, and then to the fully discrete level. Consequently, and desirably, it also helps increase the stability of the numerical method. Due to its unconditional stability, the time step size can be much larger than that of the traditional SPH methods. Numerical experiments are carried out to show the performance of the proposed energy-stable SPH method for the two-phase flow. The inheritance of mass and momentum conservation and the energy dissipation properties are verified numerically. The numerical results also demonstrate that our method captures the interface behavior and the energy variation process in a robust and efficient way.

Professor
Guihua Tang

Xi'an Jiaotong University (China)

Biography:

Professor Guihua Tang obtained a PhD in 2004, Master degree in 1999, and BEng in 1996 from XJTU. He worked as a Higher Scientific Officer in the UK STFC Daresbury Laboratory from 2007 to 2009. He has extensive research experiences in micro- and nanoscale heat transfer and photo-thermo-electricity coordinated conversion and applications in solar energy, thermoelectrics, super-thermal insulating, and phase-change process.

Nanoporous aerogel for high-temperature thermal insulation and solar energy harvesting

Abstract:

Aerogel has extensive applications due to its inherent properties. In this talk, 1) Thermal conductivities of aerogels are discussed, 2) nanoporous aerogel for high-temperature thermal insulation is discussed, 3) integrated system of aerogel and nanofluids is proposed for both heat and electricity harvest, and finally 4) silica aerogel composited with both plasmonic nanoparticles and opacifiers for high-efficiency photo-thermal harvest aerogel is presented.

Keynote Lectures

Professor

Majid Hassanizadeh

Stuttgart University (Germany)

Utrecht University (The Netherlands)

Biography:

Professor Hassanizadeh's research interests are quite broad and maybe summarized as: theoretical, computational, and experimental studies of fluids flow and transport of contaminants, viruses, and colloids in porous media.

He has received many recognitions, including:

Fellow of American Geophysical Union (2002), American Association for Advancement of Science (2007), and Academia Europea

Honorary degree of Doctor-Ingenieur from Stuttgart University (2008)

von Humboldt Research Prize (2010)

Don and Betty Kirkham Soil Physics Medal from Soil Science Society of America (2011)

Royal medal of honor of The Netherlands (2015)

Robbert E. Horton Medal from American Geophysical Union (2019).

He co-founded the International Society for Porous Media (InterPore) in 2008, and has been Managing Director of InterPore since then. InterPore has grown to become the premier society for porous media researchers.

Kinetic heat and mass transfer between two immiscible fluid phases during flow in porous media - microfluidic experiments and macroscale numerical simulations

In the macroscale studies of heat transport in porous media, the assumption of local thermal equilibrium is routinely imposed. It means that the average temperatures of all phases at any given spatial point are assumed to be equal. In many applications, where a hot fluid invades the porous medium, this assumption maybe invalid, depending on flow rate and other flow properties. We have performed two-phase flow experiments in a micromodel, at two different flow rates, and have used optical microscopy as well infrared imaging, in order to record the movement of fluids inside pores and the pore-scale temperature fields. We clearly see that the two fluids and solids have different temperatures. We have averaged the temperatures of three phases and have studied their evolution in time and space. We have then used a macroscale coupled two-phase flow and heat transport model to simulate our results. We show that for a proper modelling of the results, we must account for kinetic heat transfer between phases and the corresponding rate is influenced by the amount of interfacial area between the phases.

We have also performed colloid transport experiments during two-phase flow. Using confocal laser microscopy, we can monitor the movement of colloids and fluids inside the pores. We measure the breakthrough curve of colloids and then simulate our results. Again, we should that kinetic mass transfer and fluid-fluid interfacial area must be taken into account in order to be able to model the results properly.

Professor

Hong G. Im

King Abdullah University of Science and Technology (Saudi Arabia)

Biography:

Hong G. Im received his B.S. and M.S. in from Seoul National University, and Ph.D. from Princeton University. After postdoctoral researcher appointments at the Center for Turbulence Research, Stanford University, and at the Combustion Research Facility, Sandia National Laboratories, he held assistant/associate/full professor positions at the University of Michigan. He joined KAUST in 2013 as a Professor of Mechanical Engineering. He is a recipient of the NSF CAREER Award and SAE Ralph R. Teetor Educational Award, and has been inducted as an International Member of the National Academy of Engineering of Korea, a Fellow of the Combustion Institute and American Society of Mechanical Engineers (ASME) and an Associate Fellow of American Institute of Aeronautics and Astronautics (AIAA). He has also served as an Associate Editor for the Proceedings of the Combustion Institute, and currently on the Editorial Board for Energy and AI. Professor Im's research and teaching interests are primarily fundamental and practical aspects of combustion and power generation devices using high-fidelity computational modeling. Current research activities include direct numerical simulation of turbulent combustion at extreme conditions, large eddy simulations of turbulent flames at high pressure, combustion of hydrogen and e-fuels, spray and combustion modeling in advanced internal combustion engines, advanced models for pollutant formation, and plasma-assisted combustion.

Accelerated Computational Simulations of Chemically Reacting Flows Using Low Dimensional Manifolds and Machine Learning

Abstract:

Chemical conversion of renewable fuels, such as hydrogen and ammonia, are gaining research interest as a viable solution towards sustainable energy. Advances in computing power have enabled predictive simulations of complex phenomena involving turbulent transport and reactions at great details, but complete description of the practically relevant problems remains a tremendous challenge due to the sheer spectrum of physical and temporal scales. This presentation will focus on recent developments in mathematical and computational approaches to develop various reduced order models for high fidelity reacting flow simulations for accelerated simulations in modern CPU/GPU hybrid computing hardware. Topics covered include mathematical theories of computational singular perturbation, principal component analysis, and neural ODE, combined with deep neural network algorithms. Various engineering simulation applications will be demonstrated and discussed.

Professor

Larry Baxter

Brigham Young University (United States)

Biography:

Professor Baxter's 30+ years of experience in biomass and fossil fuel utilization for power generation have led to significant innovations that address both climate change and economic, reliable power generation. He worked at Sandia National Laboratories until 2000 and has been a BYU professor since that time. His research involves both laboratory and field experiments in both coal and biomass power plants.

Cryogenic Carbon Capture and Energy Storage: Innovative use of Multiphase Fluid Flow and Transport to Mitigate Climate Change

Abstract:

Climate change is widely regarded as one of the greatest technical challenges for current and future decades of the global community. The global community response includes contributions from technology, science, policy, government, business, and nearly every other segment. Despite these efforts, global CO2 emissions have increased monotonically with the exception of periods of global economic reversals and ambient CO2 concentrations increase every year. CO2 emission reductions required to mitigate climate change or manage its impact to a 1.5 or 2 °C temperature rise contrast starkly with the recent trends in emissions, with precious little time remaining to reconcile the past realities with the future requirements. The pathways to this reconciliation require contributions from many sources. It is especially difficult to imagine a roadmap that provides realistic opportunities to address this issue while simultaneously providing economic and living standard improvements for nations and regions most in need of these. Any realistic scenario that accomplishes will likely feature carbon capture and grid-level energy storage as major contributors. Both carbon capture and energy storage technologies have generally been slow to develop and commercialize. This slow pace is in large measure associated with the very high energy and economic cost of the technologies which far exceed those of traditional or criteria pollutants (NOx, SOx, particulate, ozone, CO, etc.) and many forms of energy generation by large fractions. This presentation describes Cryogenic Carbon Capture™, a single technology that has demonstrated a capability to make major contributions to both energy storage and carbon capture with significantly lower economic and energy demands than alternative technologies. These performance advantages come from innovative multiphase fluid flow and heat/mass transport in process unit operations that result in performance advantages that approach, within a factor of 2 or less, the theoretical minimum energy demands required for such processes. The presentation reviews CCC generally followed by some detailed discussions of the innovative steps that enable the performance advantages. The discussion also shows how the detailed and engineering models combine to describe observed process performance in ways that are perhaps nonintuitive and in any case define the boundaries of operational windows.

Professor
Jianchao Cai

China University of Petroleum, Beijing
(China)

Biography:

Jianchao Cai has focused on the petrophysical characterization and microtransport phenomena in porous media and fractal theory and its applications for more than 18 years. He has served as a visiting scholar at the University of Tennessee-Knoxville (United States) and at King Abdullah University of Science and Technology (Saudi Arabia). At present, he is working as a professor of geological resources and geological engineering at the China University of Petroleum (Beijing). Besides that, he is the founder and co-editor-in-chief of Advances in Geo-Energy Research and serves as an associate editor or editorial member for several international journals. He received an award from the National Science Foundation of China for Outstanding Youth Foundation in 2017 and Energy and Fuels Rising Stars in 2022. He was also named Global Highly Cited Researcher by Clarivate Analytics in 2020 and 2021. He has managed and completed more than 30 projects to date on oil and gas reservoir evaluation and published more than 200 peer-reviewed journal articles, 6 books, and numerous book chapters.

Modeling of Capillary-Driven Flow in Porous Media

Abstract:

Fluid flow in porous systems driven by capillary pressure is one of the most ubiquitous phenomena in nature and industry, including petroleum and hydraulic engineering as well as material and life sciences. The classical Lucas–Washburn (LW) equation and its modified forms were developed and have been applied extensively to elucidate the fundamental mechanisms underlying the basic statics and dynamics of the capillary-driven flow in porous systems. In addition, numerous studies were also conducted in recent years to develop and assess the modifications and extensions of the LW equation in various porous systems. This report first introduces the theoretical basis of the LW equation and recent progress in mathematical models is then summarizes to demonstrate the modifications and extensions of this equation to various microchannels and porous media. These include capillary tubes with nonuniform and noncircular cross sections, discrete fractures, and capillary tubes that are not straight as well as heterogeneous porous media. Numerical studies on capillary-driven flow are also analyzed, and comments on future works and research directions for capillary-driven flows in porous systems are listed at last.

Professor

Liang Gong

China University of Petroleum, East China
(China)

Biography:

Professor Liang Gong is the Associate Dean of the College of New Energy at China University of Petroleum (East China). His research interests include new energy development and utilization (geothermal, solar energy and shale gas), micro/nanoscale flow and heat transfer, and thermal management of electronic devices. He has chaired 20+ projects including the National Natural Science Foundation of China (General Program, Key Program), as well as the provincial projects and projects from petroleum companies and government. Prof. Gong has been invited to deliver keynote speeches for 15 times in the international or domestic conferences. He has published 150+ SCI/EI papers in international journals and authorized more than 20 invention patents. He serves as a director of the Engineering Thermophysics Professional Committee of the Chinese Society of Higher Education, member of Interpore China Committee, member of the ninth editorial board of Natural Gas Industry, and editor of Journal of thermal science, Computer Modeling in Engineering & Science and Open Physics, etc.

Research status and development trend of key technologies for enhanced geothermal systems

Abstract:

Hot dry rock (HDR) geothermal resources have emerged as highly attractive clean energy sources in recent years, with Enhanced Geothermal Systems (EGS) being the primary method for their exploitation. However, EGS currently faces challenges in scaling up for commercial applications, including issues such as the inefficiency of artificially fracture networks under high temperatures, unclear multi-scale and multi-field coupling laws, reduced heat extraction efficiency due to the flashing flow in geothermal wells, and low thermal-to-electricity conversion efficiency of geothermal fluids. Addressing these significant needs and bottlenecks, this work introduces four key technologies involved in the exploitation of HDR resources: artificial fracturing technology for HDR reservoirs, numerical simulation technology for geothermal extraction, efficient extraction technology for wellbore thermal fluids, and HDR geothermal power generation technology. This is intended to provide guidance for the efficient development of HDR geothermal resources.

Professor

Yosuke Hasegawa

The University of Tokyo (Japan)

Biography:

Yosuke Hasegawa obtained Ph.D. degree from The University of Tokyo in 2004 for his research on the modelling of turbulent mass transfer across an air-water interface. After finishing Ph.D., he started his academic carrier as a research associate in The University of Tokyo and involved in various projects on heat transfer, turbulence control and micro two-phase flows. From 2010 to 2012, he was appointed as a visiting professor at Center for Smart Interfaces in Technical University of Darmstadt, Germany, under the support of Japan Society for the Promotion of Science (JSPS). In 2013, he was appointed as a lecturer at Institute of Industrial Science in The University of Tokyo. Since then, he has been leading his research group as a principal investigator to present, and working on various optimization problems in thermo-fluids engineering. From 2018 to 2020, he stayed at Brown University as a visiting scholar, and launched new projects on biofluid mechanics and applications of machine learning to flow problems.

Shape and Topology Optimization for coupled conductive, convective and radiative heat transfer problems

Abstract:

Heat transfer problems encountered in engineering often involve complex physical phenomena such as turbulent flows and coupling of different heat transfer modes such as conduction inside solid, convective heat transfer and even radiative transfer in fluid media. In the present talk, we introduce our recent work to establish a unified numerical approach to reproduce coupled conductive, convective and radiative heat transfer inside complex geometries in the framework of an open-source software, OpenFOAM. Furthermore, we integrate adjoint-based shape and topology optimization algorithms to the developed solver to establish a novel tool for the optimal design of various thermo-fluids devices. Finally, we address experimental validation of the optimal shapes by utilizaing the additive manufacturing technology.

Professor

Hiroshi Iwai

Kyoto University (Japan)

Biography:

Dr. Hiroshi Iwai has been a Professor at the Faculty of Engineering, Kyoto University, Japan since 2019. He obtained his Ph.D. in Engineering from Kyoto University in 1999 Iwai has made over 200 scholarly contributions, including nearly 100 peer-reviewed research papers. He has been an editor for the JTST, TSE and JGPP. Early in his research career, he worked on convective heat transfer enhancement, targeting high-temperature heat exchangers and internal cooling of gas turbine blades. His research area gradually shifted to those related to energy devices involving reactions, such as SOFC/SOEC and reformers. One of his main research topics today focuses on elucidating and controlling heat, mass, and charge transport phenomena in porous electrodes and catalysts and the macroscale thermal control of devices based on these phenomena.

Numerical approach to understanding the internal phenomena of solid oxide fuel cells

Abstract:

To achieve the safe and efficient operation of solid oxide fuel cells (SOFCs), it is necessary to understand the internal phenomena and control the operation state such as temperature and gas concentration distribution. Numerical analysis is an effective tool and various simulation models have been proposed at different scales: electrode, single cell, stack, and system. Electrode simulation has made significant progress in the last decade or so, with the availability of microstructural data on porous electrodes by FIB-SEM and nano X-ray tomography. CFD-based macro-scale simulations have also developed and commercial packages are available today. This presentation will provide an overview of recent developments in SOFC numerical analysis and will present an attempt to perform cell or stack-level analysis with a relatively low computational load while taking into account the effects of electrode microstructure.

Professor

Mingjia Li

Beijing Institute of Technology (China)

Biography:

Dr. Ming-Jia Li is professor of School of Mechanical Engineering, Beijing Institute of Technology. She was awarded international awards and national awards such as Asian Young Scientist Award, National Young Top-notch Talents Program, Thousand Talents Program of Shannxi Province, Outstanding Young Investigator Award in Shannxi Province, National Innovative Talents Support Plan of China Postdoctoral Foundation, Outstanding Doctoral Dissertation of Shaanxi Province, and First Prize of Provincial Natural Science Award etc. She serves as the associate editor of journal of Applied Thermal Engineering and Results in Engineering. She is also, amounts other, on the editorial boards of other 6 international journals, the reviewers for numerous international journals, and the secretary general of International Conference on Supercritical CO2 Power System. She is the Junior Commission Member of B2 Professional Committee of International Institute of Refrigeration, the director of Working Committee of New Energy Storage Technology and Comprehensive Energy System of Chinese Association of Refrigeration, the deputy director of Youth Committee of Heat and Mass Transfer of Chinese Society of Engineering Thermophysics, and the member of Youth Committee of the 10th Council of Chinese Association of Refrigeration etc. She was granted her bachelor degree from University of Liverpool (U.K) and master degree from University of Nottingham (U.K.). She obtained the doctoral degree from Xi'an Jiaotong University with the joint program cooperated by Columbia University (U.S). She mainly focuses on Energy-saving theories & new methods in efficient energy utilization, and Biomass carbon sequestration. As a principle investigator, she hosts many national research programs, eg. the Key Project of National Science Foundation of China-topics, National Science Foundation of China etc. She published journal papers in top international journals with the h-index of 47. Among them, 14 papers are selected in Essential Science Indicators (1% top). She has 30 patents of invention and 10 software copyrights. She also delivered more than 35 plenary / invited talks and served as session chairs in international conferences.

Numerical and experimental study of multiphysical effects on microalgae sequestration and performance enhancement

Abstract:

Microalgae cultivation becomes a promising solution to limit CO2 emission and produce renewable energy because of its high efficiency and outstanding productivity. There is a complex multi-physical process for the microalgae cultivation in photobioreactors (PBRs). The gas-liquid multiphase flow in the cultivation medium carries the microalgae cells to circulate in the PBR with non-uniform light intensity distributions. The concentration of nutrients and CO2, as well as the light history of cells, influence the growth of microalgae simultaneously. In order to analyze the influences of multiphysical effects on the growth of microalgae and carbon sequestration, a comprehensive model including the liquid-gas multiphase flow, light distribution, microalgae cell motion and growth kinetics should be established. In this work, the comprehensive multi-physical model for the simulation of microalgae growth in PBRs is presented. The free-surface lattice Boltzmann model is developed to simulate the bubble flows. The radiative transfer equation with collimated light irradiation is solved by a discrete ordinate model to provide the light intensity distribution. The microalgae cell motion is simulated by a Lagrangian tracking model. The combination of the above models provided the light history of microalgae cells. By coupling with kinetic models, the growth of biomass concentration is finally obtained. Meanwhile, a temporal extrapolation scheme is proposed to bridge the gap between time scales for flow simulation in several seconds and the microalgae growth in hours and days. The analyses about the interaction between mass and light transportation in the PBRs are presented, and their influences on the growth of microalgae will be discussed. Experiments are further conducted to validate the proposed multi-physical models and the optimization of microalgae cultivation. An optimal nutrients supplementary strategy is proposed to optimize the growth rate by maintaining the optimal concentration of nitrogen and phosphorus. Finally, the evaluation system of flow fields in PRBs is established based on the above numerical and experimental results that include the integrating parameters such as turbulent kinetic energy, dead zone area, and gas holdup. Based on the evaluation criteria, the flow field of plate PRBs and column PRBs are optimized. In summary, this study explains the influences of multiphysical effects on microalgae growth in PBRs. It provides guidance to the optimal ambiance of carbon sequestration and the future applications of PRBs.

Professor

Zhonghua Qiao

The Hong Kong Polytechnic University (China)

Biography:

Prof. QIAO Zhonghua received his PhD degree in the Department of Mathematics at Hong Kong Baptist University in 2006. Before joining Department of Applied Mathematics, the Hong Kong Polytechnic University as an Assistant Professor in 2011, he was a postdoctoral research associate in North Carolina State University in 2006-2008 and was an assistant professor in Hong Kong Baptist University in 2008-2011. Prof. Qiao was promoted to Associate Professor in 2017 and Professor in 2021. Prof. Qiao is the associate director of Chinese Academy of Sciences (CAS) Academy of Mathematics and Systems Science (AMSS) and the Hong Kong Polytechnic University (PolyU) Joint Laboratory of Applied Mathematics. He is the Secretary-General of Hong Kong Society for Industrial and Applied Mathematics (HKSIAM) and the treasurer of The Hong Kong Mathematical Society. Prof. Qiao's research interests are numerical analysis and scientific computing. He has been making significant contributions to numerical analysis and scientific computing, in particular to numerical investigations of nonlinear partial differential equations in phase-field simulations, which have become increasingly important in many applications on phase transition of multi-component mixtures. In recognition of his perseverance, diligence, and accomplishments in pursuing exceptional quality in research, Prof. Qiao received Hong Kong Research Grants Council (RGC) Early Career Awards in 2013 and Hong Kong Mathematical Society Award for Young Scholars in 2018. In 2020, Prof. Qiao has been selected as one of the 10 RGC Research Fellows 2020/2021.

Free energy based multiple-distribution-function lattice Boltzmann method for multi-component and multi-phase flow

Abstract:

Multi-phase and multi-component fluid flow are fundamental phenomena in both nature and numerous engineering applications. In this work, a multiple-distribution-function lattice Boltzmann model (MDF-LBM) for multi-component and multi-phase flow is developed. According to the diffuse interface theory and free energy model, the hydrodynamic equations of multi-component and multi-phase system, which consists of a Cahn-Hilliard (CH) type mass balance equation with cross diffusion terms for each species and momentum balance equation, is obtained. Through utilizing the relationship of total chemical potential and the general pressure, the momentum balance equation can be reformulated as a potential form. To avoid redundant density calculations, an MDF-LBM is developed by considering the CH type mass balance equation and potential form momentum equation as a coupled convection-diffusion system. Several numerical experiments were conducted to evaluate the capabilities of the proposed MDF-LBM method, including the spreading of a liquid lens, layered Poiseuille flow, bubble rise in stratified layers, and 3D multi-component two-phase hydrocarbon mixtures. Numerical results show that the present MDF-LBM can capture the phase behavior accurately and also can guarantee the mass conservation property. The numerical results also show that the calculated interface tension agrees well with the laboratory experimental data.

Professor

Jaiyoung Ryu

Korea University (Korea)

Biography:

Jaiyoung Ryu is an associate professor in the School of Mechanical Engineering at Korea University. He received his Ph.D. in Mechanical Engineering from Stanford University in 2010 and worked as a post-doc and research scientist at Los Alamos National Laboratory and the University of California, Berkeley. His research interests include high-speed turbulence, turbulent heat transfer, flow instability, aeroacoustics, and hemodynamics. His current externally funded projects include numerical simulations of the Hyperloop system, gas turbine engines, and cardio- and cerebro-vascular hemodynamics. He serves as an Associate Editor of Engineering Applications of Computational Fluid Mechanics.

Analytical and Numerical Investigations of Aerodynamic Characteristics in Hyperloop System

Abstract:

The Hyperloop system has gained significant attention for its potential to provide faster, cost-effective, and more reliable transportation. Operating in a near-vacuum environment, it minimizes aerodynamic drag, reducing expenses and significantly shortening travel times between distant cities by achieving supersonic speeds. The unique flow characteristics of the Hyperloop system result from a combination of factors, including low-pressure surroundings, a high blockage ratio, high velocity, and notable compressibility effects [1,2]. These conditions distinguish it as a challenging and distinctive subject, setting it apart from traditional fluid dynamics problems. This study presents a comprehensive investigation into various fundamental aspects of the Hyperloop system, with a specific focus on aerodynamics. Theoretical predictions regarding shock-wave propagation in front of the pod and drag on the pod are provided, based on the quasi-1D assumption, converging-diverging nozzle principles, and normal shock theory. Through simulations, three distinct flow regimes within the Hyperloop system have been identified: subsonic below the critical Mach number, subsonic above the critical Mach number, and supersonic. These findings and theoretical predictions have substantial implications for the future development and enhancement of the Hyperloop system, paving the way for an era of efficient and high-speed travel.

Professor

Bok Jik Lee

Seoul National University (Korea)

Biography:

- 1993.3-1997.2 Seoul National University, Aeronautical Eng, BS degree
- 1997.3-1999.2 Seoul National University, Aeronautical Eng, MS degree
- 2004.9-2009.8 Seoul National University, Aeronautical Eng, Ph. D.
- 1999.3-2007.8 Researcher at Agency for Defense Development
- 2009.7-2010.12 Principal Researcher at LIG Nex1
- 2011.1-2012.12 Research Associate at University of Cambridge
- 2013.3-2016.11 Research Scientist at KAUST
- 2016.12-2019.2 Assistant Professor at GIST
- 2019.3-2021.2 Assistant Professor at Seoul National University
- 2021.3-Present Associate Professor at Seoul National University

Study on reactive flow dynamics using high fidelity numerical simulations

Abstract:

This presentation will introduce the study on reactive flow dynamics using high fidelity numerical simulations.

Invited Talks

Homood M. Alotaibi, Saudi Standards, Metrology and Quality Organization (SASO), Saudi Arabia

Fan Bai, Xi'an Jiaotong University, China

Huangxin Chen, Xiamen University, China

Yu-jie Chen, Beijing Institute of Petrochemical Technology, China

Zhuo Chen, University of Alberta, Canada

Wenzhen Fang, Xi'an Jiaotong University, China

Kunio Fujiwara, Osaka University, Japan

Junjun Guo, King Abdullah University of Science and Technology, Saudi Arabia

Yangyu Guo, Harbin Institute of Technology, China

Dongxu Han, Beijing Institute of Petrochemical Technology, China

Pu He, Xi'an Jiaotong University, China

Qiaolin He, Sichuan University, China

Wentao Ji, Xi'an Jiaotong University, China

Xinlei Liu, King Abdullah University of Science and Technology, Saudi Arabia

Jingfa Li, Beijing Institute of Petrochemical Technology, China

Zhuo Li, Tongji University, China

Yutong Mu, Xi'an Jiaotong University, China

Tomohiro Nimura, Tokyo University of Agriculture and Technology, Japan

Zhiguo Qu, Xi'an Jiaotong University, China

Jihong Shi, King's College London, United Kingdom

Donghyuk Shin, Korea Advanced Institute of Science & Technology (KAIST), Korea

Makoto Sugimoto, Tohoku University, Japan

Ryuta X. Suzuki, Tokyo University of Agriculture and Technology, Japan

Chiyu Xie, University of Science and Technology Beijing, China

Xiaoping Xie, Sichuan University, China

Bicheng Yan, King Abdullah University of Science and Technology, Saudi Arabia

Hu Zhang, Xi'an Jiaotong University, China

Jianfei Zhang, Xi'an Jiaotong University, China

Tao Zhang, King Abdullah University of Science and Technology, Saudi Arabia

Shao-Fei Zheng, North China Electric Power University, China

Conference Program

December 04, Monday 8:00-12:00 (Saudi Time)

Banquet Room, Meeting ID: 8894070666

Open ceremony and Plenary lectures

8:00-8:30	**Opening Ceremony**	
Session 1: Plenary Lectures **Chair: Hong G. Im**		
Time	**ID**	**Title, Speaker, Affiliation**
8:30-9:15	Plenary Lecture	**Algebraic Non-Equilibrium Wall Modelling for Large Eddy Simulation** Kazuhiko Suga Osaka Metropolitan University, Japan
9:15-10:00	Plenary Lecture	**Computational bubble/droplet dynamics and applications** Gihun Son Sogang University, South Korea
10:00-10:30	**Coffee Break**	
10:30-11:15	Plenary Lecture	**Robust and Efficient Modeling of Two-Phase Flow: From Sharp Interface to Diffusive Interface Models, and from Mesh-Based to Mesh-Free Methods** Shuyu Sun King Abdullah University of Science and Technology, Saudi Arabia
11:15-12:00	Plenary Lecture	**Nanoporous aerogel for high-temperature thermal insulation and solar energy harvesting** Guihua Tang Xi'an Jiaotong University, China

December 04, Monday 14:00-18:00 (Saudi Time)

Banquet Room, Meeting ID: 8894070666

Session 2: Keynote Lectures

Chairs: Shuyu Sun & Gihun Son

Time	ID	Title, Speaker, Affiliation
14:00-14:30	Keynote Lecture	**Accelerated Computational Simulations of Chemically Reacting Flows Using Low Dimensional Manifolds and Machine Learning** Hong G. Im King Abdullah University of Science and Technology, Saudi Arabia
14:30-15:00	Keynote Lecture	**Cryogenic Carbon Capture and Energy Storage: Innovative use of Multiphase Fluid Flow and Transport to Mitigate Climate Change** Larry L. Baxter Brigham Young University, United States of America
15:00-15:30	Keynote Lecture	**Analytical and Numerical Investigations of Aerodynamic Characteristics in Hyperloop System** Jaiyoung Ryu Korea University, South Korea
15:30-16:00	Keynote Lecture	**Numerical and experimental study of multiphysical effects on microalgae sequestration and performance enhancement** Mingjia Li Beijing Institute of Technology, China
16:00-16:30	**Coffee Break**	
16:30-17:00	Keynote Lecture	**Kinetic heat and mass transfer between two immiscible fluid phases during flow in porous media-microfluidic experiments and macroscale numerical simulations** S. Majid Hassanizadeh Stuttgart University, Germany; Utrecht University, The Netherlands
17:00-17:30	Keynote Lecture	**Free energy based multiple-distribution-function lattice Boltzmann method for multi-component and multi-phase flow** Zhonghua Qiao The Hong Kong Polytechnic University, China
17:30-18:00	Keynote Lecture	**Numerical approach to understanding the internal phenomena of solid oxide fuel cells** Hiroshi Iwai Kyoto University, Japan

December 05, Tuesday 08:00-12:00 (Saudi Time)

Marina Room, Meeting ID: 8894070666

Session subject: Special Topic -Modeling, Simulation, Energy and Environment
Chairs: Kazuhiko Suga & Shuyu Sun

Session 3：Special Topic -Modeling, Simulation, Energy and Environment -1

Time	ID	Title, Speaker, Affiliation
08:00-08:30	Keynote Lecture	**Research status and development trend of key technologies for enhanced geothermal systems** Liang Gong, China University of Petroleum (East China), China
08:30-08:50	Invited talk ASCHT2023-101	**Self-similar characteristics of steady and unsteady turbulent jets** Donghyuk Shin, Korea Advanced Institute of Science & Technology (KAIST), South Korea
08:50-09:05	ASCHT2023 - 001	**High throughput screening of covalent organic frameworks membrane for hydrogen separation from hydrogen-doped natural gas** Zheng Gao, Xi'an Jiaotong University, China
09:05-09:20	ASCHT2023 - 136	**A New Simplified Simulation Method and the lnvestigation on Flow and Heattransferin Internally Threaded Tubes.** Bingcheng Li, Xi'an Jiaotong University, China
09:20-09:35	ASCHT2023-030	**Influence of cut-off wavelength on the performance of spectrally selective volumetric solar receiver** Shen Du, Xi'an Jiaotong University, China
09:35-09:50	ASCHT2023-199	**Experimental investigation and dynamic simulation of sorption-enhanced CO2 methanation in a packed bed reactor** Xinzhu Mou, Nanjing University of Aeronautics and Astronautics, China
09:50-10:20	**Coffee Break**	

Session 4：Special Topic -Modeling, Simulation, Energy and Environment -2		
Time	**ID**	**Title, Speaker, Affiliation**
10:20-10:50	Keynote Lecture	**TBD** Bok Jik Lee, Seoul National University, Korea
10:50-11:10	Invited talk ASCHT2023-025	**Performance analysis of PEMEC considering oxygen distribution characteristics and LGDL anisotropy** Jianfei Zhang, Xi'an Jiaotong University, China
11:10-11:25	ASCHT2023-072	**Molecular Dynamics Study of Interfacial Nanobubble on Convexo-concave Surface** Yusuke Jonosono, University of the Ryukyus, Japan
11:30-11:45	ASCHT2023-053	**Modeling and temperature control of water-cooled PEMFC system** Junhong Chen, Xi'an Jiaotong University, China
11:45-12:00	ASCHT2023-073	**Numerical simulation of separation and transportation of liquid water-air in the cathode channel of PEM fuel cells** Min Wang, Huairou Laboratory, China

December 05, Tuesday 08:00-12:00 (Saudi Time)

Talah Room, Meeting ID: 7943441949

Session subject: Computational heat transfer and fluid dynamics
Chairs: Jaiyoung Ryu & Xinlei Liu

Session 5：Computational heat transfer and fluid dynamics -1

Time	ID	Title, Speaker, Affiliation
08:00-08:20	Invited talk ASCHT2023 - 007	**Improved Robustness and Efficiency of Fully Coupled Pressure-Based Algorithm for Compressible Flows with Careful Treatment of Boundary Conditions** Wentao Ji, Xi'an Jiaotong University, China
08:20-08:40	Invited talk ASCHT2023 - 195	**Mesoscopic simulation of hydrodynamic heat transport in graphitic micro- and nano-structures** Yangyu Guo, Harbin Institute of Technology, China
08:40-08:55	ASCHT2023 - 021	**Numerical investigation of flow pattern and heat transfer characteristics in manifold microchannel heat sink for two-phase flow** Wei Li, Zhejiang University, China
08:55-09:10	ASCHT2023-067	**Local quenching distance and local quenching-induced wall heat flux of V-shape flame in a turbulent channel flow** Ye Wang, Tokyo Institute of Technology, Japan
09:10-09:25	ASCHT2023-068	**Local non-equilibrium heat transfer and parameter optimization in laser thermal therapy for nevus of Ota** Chenggang Deng, Xi'an Jiaotong University, China
09:25-09:40	ASCHT2023-070	**The Influence of Contained Cold Aisle Configuration on Air Flow Organization in Data Centers** Junyu Chen, Xi'an Jiaotong University, China
09:40-09:55	ASCHT2023-086	**Numerical Simulation of a Hybrid Energy System Proposed for Low Carbon Data Center** Zixing Wang, Xi'an Jiaotong University, China
09:55-10:25	**Coffee Break**	

Session 6：Computational heat transfer and fluid dynamics -2		
Time	**ID**	**Title, Speaker, Affiliation**
10:25-10:45	Invited Talk ASCHT2023 - 038	**An accurate and simple circle-based interface reconstruction algorithm based on the VOSET method** Yujie Chen, Beijing Institute of Petrochemical Technology, China
10:45-11:00	ASCHT2023 - 089	**A POD-Galerkin analysis method based on the FVM for multilayer nonlinear heat conduction problems** Xiangyou Feng, Xi'an Jiaotong University, China
11:00-11:15	ASCHT2023 - 090	**Data Centres Load Allocation Based on Temperature Rise Matrix Approach** Xianhao Liu, Xi'an Jiaotong University, China
11:15-11:30	ASCHT2023-091	**Scalar Dissipation Rate Characteristics in a Decelerating Jet. A Direct Numerical Simulations Study** Vlad Aparece-Scutariu, Romanian Research and Development Institute for Gas Turbines, Romania
11:30-11:45	ASCHT2023-094	**Numerical simulation of cooling performance of single-phase immersion cooling for a server** Xiaoming Gong, Xi'an Jiaotong University, China
11:45-12:00	ASCHT2023-096	**Modeling and analysis of fluid-solid coupling heat transfer in transonic nozzle** Wei Zhu, Xi'an Jiaotong University, China

December 05, Tuesday 08:00-12:00 (Saudi Time)

Almurooj Auditorium, Meeting ID: 6170704786

Session subject: Industrial heat transfer and fluid flow
Chairs: Hu Zhang & Xiaole Li

Session 7： Industrial heat transfer and fluid flow -1

Time	ID	Title, Speaker, Affiliation
08:00-08:20	Invited talk ASCHT2023-207	**Toward Accelerating Geo-Energy Reservoir Management – Calibration, Prediction, Optimization** Bicheng Yan, King Abdullah University of Science and Technology, Saudi Arabia
08:20-08:40	Invited talk ASCHT2023-222	**Robust globally divergence-free Weak Galerkin finite element method for incompressible Magnetohydrodynamics flow** Xiaoping Xie, Sichuan University, China22
08:40-08:55	ASCHT2023 -010	**Exact solution of radiative flux and radiative thermal conductivity of aerogel** Haibo Xu, Xi'an Jiaotong University, China
08:55-09:10	ASCHT2023-028	**Study on the non-uniform arrangement of air-fuel serpentine tube heat exchanger for aero-engine applications** Tao Jiang, Xi'an Jiaotong University, China
09:10-09:25	ASCHT2023-050	**Simulation and comparative analysis of conventional steam methane reforming system and system with waste heat recovery** Ruoxuan Fan, Xi'an Jiaotong University, China
09:25-09:40	ASCHT2023-051	**Numerical simulation of heat and mass transfer in arc additive manufacturing** Ze Yun, China University of Petroleum (Beijing), China
09:40-09:55	ASCHT2023-052	**Experimental and numerical study on liquid film cooling performance under heated wall condition** Guodong Zhang, Xi'an Jiaotong University, China
09:55-10:25	**Coffee Break**	

Session 8：Industrial heat transfer and fluid flow -2		
Time	**ID**	**Title, Speaker, Affiliation**
10:25-10:45	Invited talk ASCHT2023-063	**Numerical Study on Effects of Structure Parameters of the Cathode Catalyst Layer During the Cold Start Process** Pu He, Xi'an Jiaotong University, China
10:45-11:00	ASCHT2023-061	**Numerical Study on Influence of Cold Aisle Containment Leakage in Data Center on Cooling Effect under Different Air Supply Modes** Haobo Guo, Xi'an Jiaotong University, China
11:00-11:15	ASCHT2023-019	**Numerical study of the dehydration and hydration processes of the Ca(OH)2/CaO system in an indirect-direct reactor** Li Chen, Xi'an Jiaotong University, China
11:15-11:30	ASCHT2023-064	**Robust pressure prediction of oil and gas pipeline networks based on equipment embedding neural network** Weixin Jiang, Beijing Institute of Petrochemical Technology, China
11:30-11:45	ASCHT2023-066	**Numerical simulation of freezing behavior of impacting water droplets on hydrophobic surfaces** Fa-Quan Shen, Xi'an Jiaotong University, China
11:45-12:00	ASCHT2023-074	**Effects of oxygen impurity on the atmospheric nanosecond pulsed helium plasma jet** Jing-Yu Shi, Xi'an Jiaotong University, China

December 05, Tuesday 14:00-18:00 (Saudi Time)

Marina Room, Meeting ID: 8894070666

Session subject: Flow and heat transfer control
Chairs: Liang Gong & Hiroshi Iwai

Session 9：Flow and heat transfer control -1

Time	ID	Title, Speaker, Affiliation
14:00-14:20	Invited talk ASCHT2023-224	Discussion on the key technologies of pipeline transportation of hydrogen-enriched natural gas Jingfa Li, Beijing Institute of Petrochemical Technology, China
14:20-14:40	Invited talk ASCHT2023-124	**Soot formation in autothermal reforming conditions for hydrogen production** Junjun Guo, King Abdullah University of Science and Technology, Saudi Arabia
14:40-14:55	ASCHT2023 -008	**Modeling and optimization of operating conditions of air conditioning outdoor units in a multistorey U-shaped space building** Wanyu Lin, Xi'an Jiaotong University, China
14:55-15:10	ASCHT2023-018	**Numerical investigation and data-driven prediction of flow boiling heat transfer in manifold microchannels with slopes** Yi Yuan, Xi'an Jiaotong University, China
15:10-15:25	ASCHT2023-027	**Application to data center thermal management using reduced order model** Yuqing Tang, Xi'an Jiaotong University, China
15:25-15:40	ASCHT2023-041	**Three-dimensional magnetothermal convection of paramagnetic fluid inside a cavity** Masayuki Kaneda, Osaka Metropolitan University, Japan
15:40-15:55	ASCHT2023-054	**Numerical modeling and experimental validation on the thermal stress inside the three-dimensional porous calcium-based particle for thermochemical energy storage** Ruihao Bian, Beijing Institute of Petrochemical Technology, China
15:55-16:25	**Coffee Break**	

Session 10：Flow and heat transfer control -2		
Time	**ID**	**Title, Speaker, Affiliation**
16:25-16:45	Invited Talk ASCHT2023-225	**Multiscale modellings on the oxygen transport resistance in PEMFC** Wenzhen Fang, Xi'an Jiaotong University, China
16:45-17:00	ASCHT2023-031	**Floating Effect of Riblets for Drag Reduction in Turbulent Channel Flow by Direct Numerical Simulation** Hironari Otaki, Tokyo University of Agriculture and Technology, Japan
17:00-17:15	ASCHT2023 -032	**Experimental Evaluation of Drag Reduction Effect of Traveling Wavy Wall in Turbulent Boundary Layer Flow** Yasuhiro Yoshida, Tokyo University of Agriculture and Technology, Japan
17:15-17:30	ASCHT2023-033	**The Effect of Side Ribs on Drag Reduction through Streamwise Traveling Wavy Wall Deformation in Turbulent 3D-Printed Pipe Flow** Kakeru Kimura, Tokyo University of Agriculture and Technology, Japan
17:30-17:45	ASCHT2023-108	**Numerical Study on Water Distribution and Temperature Distribution of Open Cathode Air-cooled Proton Exchange Membrane Fuel Cell with Dual Serpentine Anode Flow Channels** Kunying Gong, Xi'an Jiaotong University, China
17:45-18:00	ASCHT2023-121	**Numerical study on heat transfer and flow characteristics of supercritical CO2 in a novel jet impinging heat exchanger** Zhexi Wen, Central South University, China

December 05, Tuesday 14:00-18:00 (Saudi Time)

Talah Room, Meeting ID: 7943441949

Session subject: Heat and mass transfer in porous media
Chairs: Jianchao Cai & Jingfa Li

Session 11：Heat and mass transfer in porous media -1

Time	ID	Title, Speaker, Affiliation
14:00-14:20	Invited Talk ASCHT2023 - 044	**Research on Multi-field Coupling Simulation Method for Fractured Porous Media Based on EDFM Framework** Dongxu Han, Beijing Institute of Petrochemical Technology, China
14:20-14:40	Invited talk ASCHT2023 - 167	**Numerical investigation of wettability effects on liquid infiltration into porous media using two-phase lattice Boltzmann method** Makoto Sugimoto, Tohoku University, Japan
14:40-14:55	ASCHT2023 - 057	**Lattice Boltzmann simulation of coupled thermal-solutal problems of viscoplastic fluids in heterogeneously porous media** Xuguang Yang, Hunan First Normal University, China
14:55-15:10	ASCHT2023-119	**Compositional simulation model for porous flow of macroemulsion dispersion system** Zezheng Sun, Peking University, China
15:10-15:25	ASCHT2023-120	**Model formulation of fluid flow for fracturing-shut in-flow back production process in tight oil reservoirs** Zhixue Zheng, Peking University, China
15:25-15:40	ASCHT2023-132	**Numerical study of adsorption and desorption in rarefied gas flow** Ziyang Xin, Huazhong University of Science and Technology, China
15:40-15:55	ASCHT2023-211	**An iterative scheme based on the enthalpy-porosity model and the benchmark study for solidification and segregation** Xiaoyu Feng, King Abdullah University of Science and Technology, Saudi Arabia
15:55-16:25	**Coffee Break**	

Session 12：Heat and mass transfer in porous media -2		
Time	**ID**	**Title, Speaker, Affiliation**
16:25-16:45	Invited talk ASCHT2023 - 220	**Efficient threshold dynamics methods for topology optimization for fluids and heat transfer problems** Huangxin Chen, Xiamen University, China
16:45-17:00	ASCHT2023 - 026	**Pore-scale modeling of reactive transport processes in catalyst layers with porous carbon support** Yu-Hao Lu, Xi'an Jiaotong University, China
17:00-17:15	ASCHT2023 - 034	**Experimental Study on the Extension Mechanism of Artificial Fracture Network in Hot Dry Rock Under Alternating Temperature Loading** Daobing Wang, Beijing Institute of Petrochemical Technology, China
17:15-17:30	ASCHT2023-058	**Numerical Study on heat-mass transfer characteristics in the sintering process of ternary cathode materials** Boyang Ma, University of Science and Technology Beijing, China
17:30-17:45	ASCHT2023-116	**Research on the Skid-mounted Medium-pressure Recovery Process of Scattered Natural Gas in Marginal Oil and Gas Fields** Qiyang Sun, Beijing Institute of Petrochemical Technology, China
17:45-18:00	ASCHT2023-213	**Numerical simulation study on the permeability characteristics of fractured rock under hydraulic-chemical coupling** Zheng Chen, China University of Petroleum, East China, China

December 05, Tuesday 14:00-18:00 (Saudi Time)

Almurooj Auditorium, Meeting ID: 6170704786

Session subject: Multi-scale simulation of heat transfer and mass transfer
Chairs: Xiaole Li & Daobing Wang

Session 13：Multi-scale simulation of heat transfer and mass transfer -1

Time	ID	Title, Speaker, Affiliation
14:00-14:20	Invited talk ASCHT2023 - 015	**Molecular dynamics simulation of CO2 permeation and separation in Zr-MOF membranes** Zhuo Li, Tongji University, China
14:20-14:40	Invited talk ASCHT2023 - 168	**Recent advance in understanding fundamental thermal transport property at liquid-solid interface based on molecular dynamics** Kunio Fujiwara, Osaka University, Japan
14:40-14:55	ASCHT2023 - 029	**A Reactive Molecular Dynamics Study on the Erosion of Carbon Nanostructures by Hyperthermal Water and Oxygen** Jiapeng Dai, Xi'an Jiaotong University, China
14:55-15:10	ASCHT2023- 128	**Molecular dynamics study of the distillation performance of saline solution through nanoporous membranes** Yuanhe Ding, China University of Petroleum (East China) , China
15:10-15:25	ASCHT2023- 131	**A phase-field lattice Boltzmann model for quasi-incompressible two-phase flows with high Reynolds number** Jin Bao, Huazhong University of Science and Technology, China
15:25-15:40	ASCHT2023- 221	**Closed - Loop Optimization of Well Control for Carbon Sequestration with Brine Extraction using Coarse - Grid Network Model** Billal Aslam, King Abdullah University of Science and Technology, Saudi Arabia
15:40-15:55	ASCHT2023 - 141	**Parametric optimization of acid condensation of three-dimensional finned tube heat exchangers for reducing acid corrosion** Jian Liu, Xi'an Jiaotong University, China
15:55-16:25	**Coffee Break**	

Session 14：Multi-scale simulation of heat transfer and mass transfer -2		
Time	**ID**	**Title, Speaker, Affiliation**
16:25-16:45	Invited talk ASCHT2023 - 100	**Trapping and releasing of a non-wetting droplet by viscoelastic oscillation** Chiyu Xie, University of Science and Technology Beijing, China
16:45-17:00	ASCHT2023 - 042	**Effects of Nanostructure on Local Surface Energy Transfer during Water Condensation using Molecular Dynamics Simulation** Masahiko Shibahara, Osaka University, Japan
17:00-17:15	ASCHT2023 - 080	**Study on unified numerical methods for multi-scale flow simulation from the earth's surface to outer space and their software development** Sha Liu, Northwestern Polytechnical University, China
17:15-17:30	ASCHT2023-082	**Modeling the coupling of thermal, hydraulic, and chemical processes for heat extraction in enhanced geothermal systems using a multi-scale finite volume method** Weitao Zhang, Beijing Institute of Petrochemical Technology, China
17:30-17:45	ASCHT2023-159	**Modeling the radiation of non-gray gases-particles mixture with steady discrete unified gas kinetic scheme** Xinliang Song, Huazhong University of Science and Technology, China
17:45-18:00	ASCHT2023-210	**Molecular insights into the carbon dioxide sequestration in kerogen: An accelerated algorithm coupling Molecular Dynamics simulations and Monte Carlo methods** Jie Liu, King Abdullah University of Science and Technology, Saudi Arabia

December 06, Wednesday 08:00-12:00 (Saudi Time)

Marina Room, Meeting ID: 8894070666

Session subject: AGER Special Session – Advances in Geo-Energy Research
Chairs: Shuyu Sun & Long Ju

Session 15： AGER Special Session – Advances in Geo-Energy Research -1

Time	ID	Title, Speaker, Affiliation
08:00-08:30	Keynote Lecture	**Modeling of Capillary-Driven Flow in Porous Media** Jianchao Cai, China University of Petroleum (Beijing), China
08:30-08:50	Invited talk ASCHT2023-169	**Experimental and numerical study on viscous fingering in a partially miscible system** Ryuta X. Suzuki, Tokyo University of Agriculture and Technology, Japan
08:50-09:05	ASCHT2023 - 118	**Geomechanical analysis of caprock stability under H-M/T-H-M coupling during CO2 geological storage** Enyi Yu, Peking University, China
09:05-09:20	ASCHT2023-119	**Compositional simulation model for porous flow of macroemulsion dispersion system** Zezheng Sun, Peking University, China
09:20-09:35	ASCHT2023-158	**Dynamics of CO_2 density-driven reactive flows in fractured aquifers** Peiyao Liu, Huazhong University of Science and Technology, China
09:35-09:50	ASCHT2023-161	**Role of amino acid and 1,4-dioxane on the kinetics of CO2 hydrate formation** Ayaj Ansari, Indian Institute of Technology, India
09:50-10:20	**Coffee Break**	

Session 16：AGER Special Session – Advances in Geo-Energy Research -2		
Time	**ID**	**Title, Speaker, Affiliation**
10:20-10:40	Invited talk ASCHT2023-223	**Technology transitions from the conventional petroleum energy resources to the next-generation New Energy** Tao Zhang, King Abdullah University of Science and Technology, Saudi Arabia
10:40-11:00	Invited talk ASCHT2023-216	**Modelling the mechanisms of ice crystal growth at the molecular scale** Jihong Shi, King's College London, United Kingdom
11:00-11:15	ASCHT2023-160	**Investigation of PEMFC-CHP systems based on thermal and electrical consumption data of Chinese residence** Xingbao Lyu, Xi'an Jiaotong University, China
11:15-11:30	ASCHT2023-214	**Thermohydrodynamics phase-field model for liquid-vapor phase transitions with soluble surfactants** Xiaoyu Zhang, China University of Petroleum (East China), China
11:30-11:45	ASCHT2023-208	**Research on Oil Mixing Law of the Continuous Large Drop Product Oil Pipeline** Yushu Du, China University of Geosciences, China
11:45-12:00	ASCHT2023-215	**Utilizing Deep Learning Technologies to Accelerate Reservoir Optimization for Underground Hydrogen Storage** Zhilei Han, King Abdullah University of Science and Technology, Saudi Arabia

December 06, Wednesday 08:00-12:00 (Saudi Time)

Talah Room, Meeting ID: 7943441949

Session subject: Flow and heat transfer control
Chairs: Wentao Ji & Jingfa Li

Session 17：Flow and heat transfer control -3

Time	ID	Title, Speaker, Affiliation
08:00-08:20	Invited talk ASCHT2023 - 219	**Modelling of compressible multi-component two-phase flow with multi-component Navier boundary condition** Qiaolin He, Sichuan University, China
08:20-08:40	Invited talk ASCHT2023 - 125	**Numerical Prediction of The Themal Environment And Ablation of Solid Rocket Nozzles** Hu Zhang, Xi'an Jiaotong University, China
08:40-08:55	ASCHT2023 - 075	**Non-local effects on Reynolds shear stress and turbulent heat flux in wall turbulence subject to a streamwise traveling wave of wall blowing and suction** Tingting Fang, The University of Tokyo, Japan
08:55-09:10	ASCHT2023-083	**Multi-objective Parmetr Optimzation Design of Dimple Plate Heat Exchanger** Zhengdao Li, Xi'an Jiaotong University, China
09:10-09:25	ASCHT2023-084	**Atomistic insight into the sintering of alumina-doped silica aerogels at high temperatures based on amorphous structures** Rui Yang, Xi'an Jiaotong University, China
09:25-09:40	ASCHT2023-085	**Thermal-mechanical Coupling Analysis on Insulation Schemes for the Foundation of Large Molten Salt Storage Tanks** Zhiyi Tang, Xi'an Jiaotong University, China
09:40-09:55	ASCHT2023-088	**Gas-solid coupling in a randomly distributed ceramic nanofibrous aerogel** Ebuka Okafor, Xi'an Jiaotong University, China
09:55-10:25	**Coffee Break**	

Session 18：Flow and heat transfer control -4		
Time	**ID**	**Title, Speaker, Affiliation**
10:25-10:45	Invited talk ASCHT2023 - 201	**Effect of Water on Asphaltene-Precipitation Behavior of CO2-Crude Oil Mixtures During CCUS Processes** Zhuo Chen, University of Alberta, Canada
10:45-11:00	ASCHT2023 - 109	**Numerical study and structural optimization of water-cooled mini-channel heat sinks for chip heat dissipation in data centers** Shuqi Jin, Xi'an Jiaotong University, China
11:00-11:15	ASCHT2023 - 110	**A comparative numerical study for energy consumption of air-forced direct cooling versus water cold plate indirect cooling** Yuting Li, Xi'an Jiaotong University, China
11:15-11:30	ASCHT2023-111	**Design the cold start-up strategy of the PEMFC stack under -30 ℃ with the coolant circulation** Le Lei, Xi'an Jiaotong University, China
11:30-11:45	ASCHT2023-115	**Dropwise condensation of saturated water vapor over vertical plain and pillared copper substrates** Waquar Raza, Indian Institute of Technology Kanpur, India
11:45-12:00	ASCHT2023-127	**Uncertainty analysis of the in-plane thermal conductivity of thin slab material measured by transient plane source method** Kefan Wu, Xi'an Jiaotong University, China

December 06, Wednesday 08:00-12:00 (Saudi Time)

Almurooj Auditorium, Meeting ID: 6170704786

Session subject: Industrial heat transfer and fluid flow
Chairs: Pu He & Junjun Guo

Session 19：Industrial heat transfer and fluid flow -3

Time	ID	Title, Speaker, Affiliation
08:00-08:20	Invited talk ASCHT2023 - 198	**Clean and Efficient Engine Combustion with Turbulent Jet lgnition: A Computational Study** Xinlei Liu, King Abdullah University of Science and Technology, Saudi Arabia
08:20-08:40	Invited talk ASCHT2023 - 148	**A general platform for the multi-physics digital twin technology in the thermal-fluid engineering** Fan Bai, Xi'an Jiaotong University, China
08:40-08:55	ASCHT2023 - 112	**Deep Neural Network Surrogate Model for Predicting Viscoelastic Channel Flows** Takahiro Tsukahara, Tokyo University of Science, Japan
08:55-09:10	ASCHT2023-123	**The compact schemes on non-uniform grids for numerical simulation of natural convection** Hao Ding, Xi'an Jiaotong University, China
09:10-09:25	ASCHT2023-129	**Numerical predicting of the effective thermal conductivity of a zeolite adsorption bed for thermal energy saving** Mingyang Gao, China University of Petroleum (East China), China
09:25-09:40	ASCHT2023-130	**Flow separation characteristics and its effect on the side loads of solid rocket engine nozzle** Wenjie Jiang, Xi'an Jiaotong University, China
09:40-09:55	ASCHT2023-134	**Numerical study on flow and heat transfer of jet-impingement cooling based on vortex and flow stream** Saijie Cai, Xi'an Jiaotong University, China
09:55-10:25	**Coffee Break**	

Session 20：Industrial heat transfer and fluid flow -4		
Time	**ID**	**Title, Speaker, Affiliation**
10:25-10:45	Invited talk ASCHT2023 - 155	**Reactive transport processes of oxygen in a novel designed carbon morphologies of catalyst layer in PEMFCss** Yutong Mu, Xi'an Jiaotong University, China
10:45-11:00	ASCHT2023 - 143	**A Computational Study of Desublimation Tower Characteristics for Cryogenic Carbon Capture** Pohan Chen, King Abdullah University of Science and Technology, Saudi Arabia
11:00-11:15	ASCHT2023 - 145	**Numerical Investigation of Thermocouple Probe Influence on Temperature and Velocity Fields in a Vortex Tube** Xin Na, Lanzhou Jiaotong University, China
11:15-11:30	ASCHT2023-147	**Numerical Study on Thermal Environment of High Temperature and Supersonic Wind Tunnel** Zhaojun Liu, Xi'an Jiaotong University, China
11:30-11:45	ASCHT2023-154	**Numerical modelling of desublimation process using single-domain approach** Karlo Jurina, University of Cambridge, United Kingdom
11:45-12:00	ASCHT2023-97	**Drag reduction effect by diagonal traveling wave control in turbulent channel flow** Hiroya Mamori, University of Electro-Communications, Japan

December 06, Wednesday 14:00-18:00 (Saudi Time)

Marina Room, Meeting ID: 8894070666

Session subject: Miscellaneous subjects
Chairs: Fan Bai

Session 21：Miscellaneous subjects -1

Time	ID	Title, Speaker, Affiliation
14:00-14:20	Invited talk ASCHT2023-200	**Implementation of a unified fractional step artificial compressibility with pressure projection method as a solver in OpenFOAM** Homood M. Alotaibi, Saudi Standards, Metrology and Quality Organization (SASO), Saudi Arabia
14:20-14:35	ASCHT2023 -170	**Thermal-hydraulic characteristics of heat exchangers based on triply periodic minimal surfaces** Weishi Huang, Xi'an Jiaotong University, China
14:35-14:50	ASCHT2023-191	**Mathematical prediction of UV germicidal irradiance in ventilation ducts** Yi Yang, Guangdong Ocean University, China
14:50-15:05	ASCHT2023-193	**Experimental Study on Ocean Current Power Generation Performance of Cross interface Rear Runner L-shaped Blades** Changming Ling, Guangdong Ocean University, China
15:05-15:20	ASCHT2023-194	**Experimental and Numerical Investigation on the Effect of Rib Turbulators on Film Cooling with Coolant Cross-flow** Xiang Cheng, Xi'an Jiaotong University, China
15:20-15:35	ASCHT2023-174	**Rarefaction effect flow in the gas film of foil thrust bearing** Cheng Xiong, Southeast University, China
15:35-15:50	ASCHT2023-137	**Numerical Investigation on Conjugate Heat Transfer Characteristics of Supercritical CO2 in a Horizontal D-type Straight Passage** Xin Wang, Southeast University, China
15:50-16:05	ASCHT2023-069	**Comparative Study of Mathematical Models for Describing the Distribution of Hydrogen-Enriched Natural Gas in Enclosed Spaces** Yue Su, Beijing Institute of Petrochemical Technology, China
16:05-16:20	ASCHT2023 -024	**Effects of manifold configurations on the thermal performance of subcooled flow boiling in MMC heat sinks** Weiyu Tang, Zhejiang University, China

16:20-16:35	ASCHT2023-023	**Data-driven Optimization of Gradient Catalyst Layer in PEMFC** Zihao Xuan, Xi'an Jiaotong University, China
16:20-16:35	ASCHT2023-039	**Research on thermal simulation method of dual channel radiator for diesel locomotive** Baoqi Luan, CRRC Dalian Co.,Ltd Locomotive Development Department, China

December 06, Wednesday 14:00-18:00 (Saudi Time)

Talah Room, Meeting ID: 7943441949

Session subject: Miscellaneous subjects
Chairs: Daobing Wang

Session 22：Miscellaneous subjects -2

Time	ID	Title, Speaker, Affiliation
14:00-14:20	Invited talk ASCHT2023-202	**Scale Effects of Micro Structures on the Wall-bounded Turbulent Transport for Turbine Blade Internal Cooling** Shaofei Zheng, North China Electric Power University, China
14:20-14:35	ASCHT2023-004	**A Layered Discrete Fracture-Matrix Simulation for Production Data Analysis in Well with multiple Non-Uniform conductivity fractures in Layered Tight Gas Reservoirs** Chengwei Zhang, China University of Petroleum(Beijing), China
14:35-14:50	ASCHT2023-140	**Research on High Pressure Turbulent Cavitation in Typical Microchannels Inside High Pressure Common Rail Diesel Engines** Ziyuan Zou, Xi'an Jiaotong University, China
14:50-15:05	ASCHT2023-045	**Modeling and analysis of automotive PEM fuel cell system** Zhuo Zhang, Xi'an Jiaotong University, China
15:05-15:20	ASCHT2023-122	**Performance Optimization of High-Temperature Chloride Molten Salts Solar Tower Power System Combined with SCO2 Recompression Brayton Cycle and An Improved Cylindrical Solar Receiver** Chao Li, Xi'an Jiaotong University, China
15:20-15:35	ASCHT2023-093	**The influence of fully developed laminar fluid on wall fouling in circular tube with inserted twisted tape** Caiping Liu, Lanzhou Jiaotong University, China
15:35-15:50	ASCHT2023-065	**Flow boiling in the rectangular microchannels with shallow liquid** Wei Lu, Beijing Institute of Petrochemical Technology, China
15:50-16:05	ASCHT2023-049	**The enriched-embedded discrete fracture model (nEDFM) for solving convection-diffusion problems in fractured porous media** Kaituo Jiao, Beijing Institute of Petrochemical Technology, China
16:05-16:20	ASCHT2023-020	**A framework of the transport model for high-order eddy viscosity tensor in two-dimensional turbulent flow** Xingguang Zhou, Xi'an Jiaotong University, China

16:20-16:35	ASCHT2023-149	**Performance Improvement of Nose Cone Thermal Protection System Using Directional Heat Transfer Carbon Fiber Reinforced Composite** Yisi Yu, Xi'an Jiaotong University, China

December 06, Wednesday 14:00-18:00 (Saudi Time)

Almurooj Auditorium, Meeting ID: 6170704786

Session subject: Miscellaneous subjects
Chairs: Yutong Mu

Session 23：Miscellaneous subjects -3

Time	ID	Title, Speaker, Affiliation
14:00-14:30	Keynote Lecture	**Shape and topology optimization for coupled conduction, convection and radiation problems** Yosuke Hasegawa, University of Tokyo, Japan
14:30-14:50	Invited Talk ASCHT2023-166	**Numerical study on an instability due to viscoelasticity in rotating plane Couette flow** Tomohiro Nimura, Tokyo University of Agriculture and Technology, Japan
14:50-15:05	ASCHT2023-016	**Multi-objective optimization on high pressure fuel filter parameters based on artificial neural network and genetic algorithm** Yifan Wang, Xi'an Jiaotong University, China
15:05-15:20	ASCHT2023-206	**Lattice thermal conductivity of monoclinic and tetragonal hafnia** Xing Xiang, Hong Kong University of Science and Technology, China
15:20-15:35	ASCHT2023-071	**A rapid method for component tracking in natural gas pipeline using Fourier Neural Operator** Junhua Gong, Beijing Institute of Petrochemical Technology, China
15:35-15:50	ASCHT2023-076	**Pore-scale simulation of nanoparticle transport and adsorption in packed bed using pore network model** Bing Dong, Beijing Institute of Petrochemical Technology, China
15:50-16:05	ASCHT2023-081	**Study on Improving External Film and Internal Heat Transfer Based on Laminated Cooling Configuration** Zhimin Chen, Beijing Institute of Petrochemical Technology, China
16:05-16:20	ASCHT2023-144	**Anomalous Strain-Dependent Thermal Conductivity in HKSUT-1** Hongzhao Fan, Hong Kong University of Science and Technology, China
16:20-16:35	ASCHT2023-060	**Characterizing Bubble Dynamics via Efficient and Robust Computer Vision Strategy** Mingming Huang, Sun Yat-sen University, China

Sponsor

Advances in Geo-Energy Research

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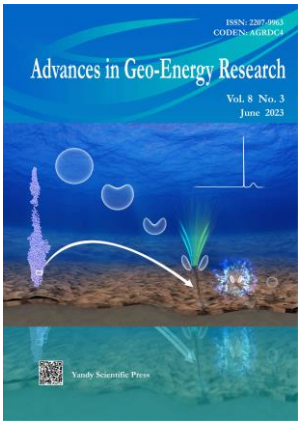
■ Focus and Scope

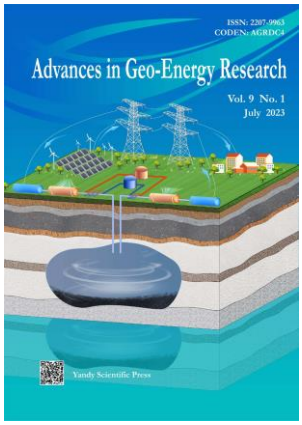
Advances in Geo-Energy Research (AGER) aims to publish high quality papers rapidly in the fields of natural geo-energy (oil, gas, coal geothermal, and gas hydrate), and focuses on combining theoretical, numerical and experimental approaches to the fundamental scientific advances in geo-energy systems.

AGER is an interdisciplinary and international periodical devoted to promote the interaction and multidisciplinary collaboration among scientific groups from different countries and regions, and both industry and academia. The scope of the journal is to provide an academic medium to researchers who are actively involved in one or more of the fields of geo-energy systems.

AGER is a monthly open access journal and free to read for all. It accepts original research articles, reviews, and rapid communications in the following domains of engineering, science and technology (but not limited to):

1) Geo-energy exploration, development and production
2) Heat and mass transfer in underground reservoirs
3) Unconventional oil and gas geology and engineering integration
4) New methods and techniques enhancing geo-energy recovery
5) Major theoretical progress and case studies of geo-energy





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13) EBSCO

■ Journal Editor/Honorary Editorial Advisor

Local Transportation

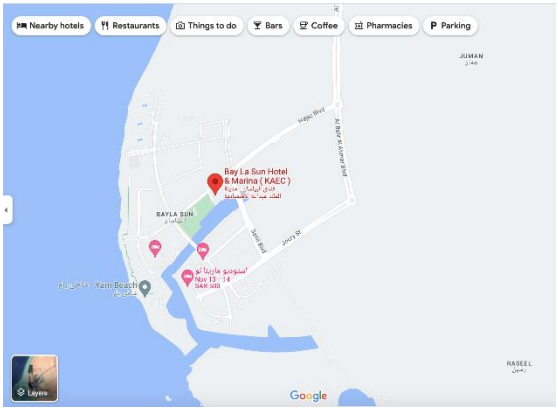
Local Transportation Information for ASCHT 2023

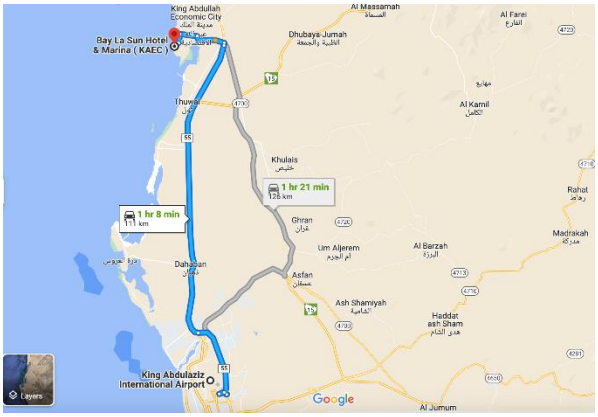
Welcome to Saudi Arabia for ASCHT 2023! To make your journey after arrival as smooth as possible, here is the information you need to plan your transportation.

From the Airport to the Hotel Venue:

Hotel Venue Address:

- The conference hotel and venue is Bay La Sun Hotel, King Abdullah Economic City.
- Location info in Arabic: فندق البيلسان. مدينة الملك عبدالله الاقتصادية.
- Location on Maps: Google Maps Link Baidu Map Link
- Make sure to have this information handy for your journey.





Transportation Options:

1. **Taxi:** Various taxicabs are available outside the terminals at Jeddah Airport. Follow the signs to the designated pickup areas.
2. **Rideshare Services:** Rideshare services, such as Uber and Careem, are readily available at the airport. You can order them online and follow the signs to the designated pickup areas.
3. **Shuttle Bus:** The local organizing committee is considering providing a shuttle bus service to ensure your smooth travel during the event. More information on routes and schedules will be provided soon.

From the Hotel to the Airport:

Airport Information:

- Jeddah Airport has several terminals. Please check the terminal indicated on your tickets.

Transportation Options:

1. **Taxi and Rideshare Services:** You can arrange for a taxi or rideshare service to pick you up from the hotel at your convenience.
2. **Hotel Shuttle:** Please check with the hotel if they can provide a shuttle service to the airport. Be sure to coordinate your departure time with the hotel's front desk.
3. **Shuttle Bus:** The local organizing committee is considering providing a shuttle bus service to ensure your smooth travel during the event. More information on routes and schedules will be provided soon.

Important Tips:

- The trip duration approximately 1 hour and 20 minutes, and the estimated cost for a one-way taxi ride is about 250 Saudi Riyals (~ 65 USD).
- Make sure to allow extra time for your journey to account for possible traffic and security checks.

We look forward to welcoming you to ASCHT 2023. If you have any further inquiries or require additional assistance, please don't hesitate to contact us. Safe travels, and we can't wait to see you at the conference!

About the Venue

Bay La Sun Hotel and Marina is located in King Abdullah Economic City, an hour's drive from Jeddah's city centre and within a walking distance to YAM Beach. It offers views of the Red Sea as well as a natural lagoon and mangrove. Whether your plans include business, leisure or a family getaway, Bay La Sun Hotel & Marina offers a unique and affordable destination within King Abdullah Economic City in the heart of the Bay La Sun district. Managed by Al-Khozama, an award-winning management company with a long and proven track record in the Saudi hospitality industry, this 5-star flagship hotel near Jeddah is a true lifestyle destination nestled along extensive waterways, natural lagoons and mangroves with breath-taking views over the Red Sea and the Marina. Discover a superior urban hospitality experience for business and leisure seekers alike, redefining industry standards in the Kingdom by offering impeccable guest service, distinctive food and beverage venues, unique architecture and ample amenities. King Abdullah University of Science and Technology is 19 km away and King Abdulaziz Airport is 82 km away.