



**ICAERA**  
2024

# 5th International Conference On Advances In Energy Research And Applications (ICAERA 2024)

November 21 - 23, 2024 | Lisbon, Portugal

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ISBN: 978-1-990800-49-8 | ISSN: 2563-531X

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# WELCOME MESSAGE FROM THE CONFERENCE CHAIR

On behalf of the International Academy of Science, Engineering and Technology (International ASET Inc.), the organizing committee would like to welcome you to the 5<sup>th</sup> International Conference on Advances in Energy Research and Applications (ICAERA 2024).

The goal of ICAERA 2024 is to provide a space for scholars from all over the world to present advances in the relevant fields and to foster an environment conducive to exchanging ideas and information. This conference will also provide an ideal environment to develop new collaborations and meet experts on the fundamentals, applications, and products of the mentioned fields.

In the fifth meeting of this conference, two keynote speakers will share their expertise with the aim of exposing participants to a wide spectrum of applications, and to foster crosspollination of ideas and develop new research interests. In addition, approximately 8 papers will be presented from professors, students, and researchers across the world.

We thank you for your participation and contribution to the 5<sup>th</sup> International Conference on Advances in Energy Research and Applications (ICAERA 2024). We wish you a very successful and enjoyable experience.

**Dr. Sohel Murshed**  
**University of Lisbon, Portugal**  
*Conference Chair*  
*ICAERA 2024*

**Dr. Wael H. Ahmed**  
**University of Guelph, Canada**  
*Conference Chair*  
*ICAERA 2024*

**Dr. Boguslaw Kruczek**  
**University of Ottawa, Canada**  
*Conference Chair*  
*ICAERA 2024*

# ABOUT ICAERA 2024

**The 5th International Conference on Advances in Energy Research and Applications (ICAERA 2024) aims to become the leading conference in fields related to Energy Research and Applications.** The goal of ICAERA 2024 is to gather scholars from all over the world to present advances in the relevant fields and to foster an environment conducive to exchanging ideas and information. This conference will also provide an ideal environment to develop new collaborations and meet experts on the fundamentals, applications, and products of the mentioned fields.

ICAERA 2024 is an international conference will be held yearly. This conference focus on all aspects Energy Research and Applications. ICAERA 2024 Will be held this year as a hybrid conference

**ICAERA 2024** is an acronym for **I**nternational **C**onference, on **E**nergy **R**esearch and **A**pplications.

- The proceedings are published in Ottawa, Canada.
- All papers were peer-reviewed
- The congress proceedings is published under an ISSN and ISBN number
- Each paper is assigned a unique DOI number by [Crossref](#)
- The conference proceedings is indexed by [Google Scholar](#)
- The proceedings is permanently archived in [Portico](#) (one of the largest community-supported digital archives in the world)



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# SCIENTIFIC COMMITTEE

We would like to thank the following for accepting to act as a member of the Scientific Committee for the ICAER 2024 Conference:



**Dr. Sohel Murshed**  
University of Lisbon, Portugal  
Conference Chair



**Dr. Wael H. Ahmed**  
University of Guelph, Canada  
Conference Chair



**Dr. Boguslaw Kruczek**  
University of Ottawa, Canada  
Conference Chair

## Scientific Committee Members

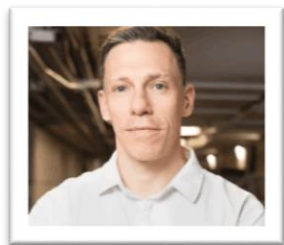
- **Dr. Müslüm Arıcı**, Kocaeli University, Turkey
- **Dr. Hitesh Bindra**, Purdue University, USA
- **Dr. Surendra Kachhwaha**, Pandit Deendayal Energy University, India
- **Dr. Shafiqur Rehman**, King Fahd University of Petroleum and Minerals, Saudi Arabia
- **Dr. Fabio Subba**, Politecnico di Torino, Italy
- **Dr. Turgut Türsoy**, Near East University, Nicosia, Turkey
- **Dr. Somchai Wongwises**, King Mongkut's University of Technology Thonburi, Thailand
- **Dr. Stavros Yanniotis**, Agricultural University of Athens, Greece

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# KEYNOTE SPEAKERS

The keynote information for the 5th International Conference on Advances in Energy Research and Applications (ICAER 2024) is as follow:

## Keynote Speakers



**Dr. Louis Gosselin**  
**Université Laval, Canada**



**Dr. Saeed Moghaddam**  
**University of Florida, USA**

# KEYNOTE SPEAKER



**Title:** “Glocalization” of Energy Transition - What Research and Advances in the Canadian Arctic Can Teach Us

**Dr. Louis Gosselin, Université Laval, Canada**

[Abstract](#)

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Louis Gosselin is a full professor at the Department of Mechanical and Industrial Engineering at Université Laval (Quebec City, Canada). The objective of his research is to improve the energy performance of buildings and industrial processes, in close collaboration with governmental, industrial and community partners. His team focused on building envelope, occupant behavior, optimal HVAC control, aluminum production, greenhouse agriculture, and machining industries, among others. Over the years, Professor Gosselin worked with local organizations in Nunavik, an Arctic region from the North of Canada, on housing and energy-related issues. He has become interested in developing bridges between engineering and social sciences through energy justice.

# KEYNOTE SPEAKER



**Title:** Information Science and Computing  
Technologies for Civil Infrastructural Engineering  
**Dr. Saeed Moghaddam, University of Florida,  
USA**

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Dr. Saeed Moghaddam is William Powers Professor of Mechanical and Aerospace Engineering at the University of Florida (UF). He earned his PhD from the University of Maryland (UMD) in 2006. Before joining UF, he was a postdoctoral associate (2007-2010) at the University of Illinois at Urbana-Champaign (UIUC). He has made seminal contributions to the field of phase-change heat transfer, including characterizing various mechanisms of heat transfer at the fluid-solid interface with micrometers and microseconds spatial and temporal resolutions, respectively, and discovery of the origin of critical heat flux (CHF) as well as novel enhancement techniques. He has received numerous awards for his research and educational work such as Micro-FIP Leadership Award for his impactful scientific contributions and leadership in fostering collaboration and innovation, ASME ICNMM Outstanding Early CAREER Award, and University of Florida (UF) College of Engineering (COE) PhD Advisor of the Year. His work has been featured in different media outlets such as Data Center Knowledge and Heat Pump Magazine. He has published 150+ technical articles and book chapters and has 20 patents. He has given over 30+ Plenary, Keynote, and Vision talks at different venues. Dr. Moghaddam is Fellow of ASME and ASHRAE and member of ASTFE, IEEE, and AAAS.



# LIST OF PAPERS

The following papers were presented at the 5th International Conference on Advances in Energy Research and Applications (ICAER 2024)

## Energy Conversion and Storage

**Comparison of Stratification Performance in Oil-based Thermal Storage Tank for Different Immersed Discharging Coil Configurations**

Authors: Anas A.E Ahmed, Rudrodip Majumdar, Sandip K. Saha

**Biochars Produced from Pressurized Torrefaction: Fuel Properties and Combustion Behaviour**

Authors: Omar Dacres, Fadi Mansour, Sebastian Fendt

**Thermal Management Of Highly Concentrated Photovoltaic-Thermal System Using Confined Jet Impingement And Thermoelectric Generator**

Authors: Abhishek Gupta, Sandesh S. Chougule, Sandip K. Saha

**Nio Nano- And Micro-Particles Prepared By Solvothermal Method – Good Catalysts for CO2 Methanation**

Authors: Arkadii Bikbashev, Libor Kvitek, Tomáš Stryšovský

# LIST OF PAPERS

## Poster Session

**Impact of BiBO<sub>3</sub>, NaF and BiF<sub>3</sub> Doping on the Thermoelectric Properties of Bi<sub>2</sub>Ca<sub>2</sub>Co<sub>2</sub>O<sub>y</sub> Ceramics**

Authors: Iamze Kvartskhava, Nikoloz Margiani, Vakhtang Zhghamadze, Masatoshi Takeda, Giorgi Mumladze<sup>1</sup>, Giorgi Kakhniashvili, Astghik Kuzanyan

**Explosion of LPG-air Mixtures in a Spherical Vessel in the Presence of Hydrogen**

Authors: Movileanu Codina, Razus Domnina, Giurcan Venera, Mitu Maria

**Water Transport and Phase Change Phenomena in Polymer Electrolyte Fuel Cells Using Temperature Dependent Phase Separation Model**

Authors: Sungjea Park, Sukkee Um

# SPONSORS

International ASET Inc. would like to thank the following sponsors for their support of ICAER 2024:



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# ICAERA 2025

The 6th International Conference on Advances in Energy Research and Applications (ICAERA 2025) will be held on October 29-31, 2025 in Barcelona, Spain.



For inquiries and to obtain further information on the congress, please visit the [website](https://2025.icaera.com)

You can also email [info@icaera.com](mailto:info@icaera.com) or call us at:

+1-613-834-9999

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# JOURNAL PUBLICATION

Selected articles from the conference will be published in the Journal of Fluid Flow, Heat and Mass Transfer (JFFHMT) after a secondary review process.

These journals has adopted to the open-access model, meaning all free access to the journals' articles and content with no need for subscription. This ensures larger audience and therefore higher citations.

All published papers of JFFHMT will be submitted to Google Scholar and be indexed in Scopus. Additionally, they will be permanently archived in Portico (one of the largest community-supported digital archives in the world) and will be assigned unique DOIs.

Please visit the following websites for the respected journals: **JFFHMT:** <https://jffhmt.avestia.com>

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# ETHICS & MALPRACTICE

At International ASET Inc., we take matters that relate to ethics in publishing very seriously. We believe that the peer-review publication process is a vital building block of academia, and its integrity must be maintained at all costs, which is why every article will be peer-reviewed by several experts in the field. Under peer-review, experts in the related fields are required to provide opinions and comments on the improvements of the submissions.

We are proud of our efforts towards abiding by the guidelines of ethics, integrity, and high standards in publishing.

**Following are the ethics guidelines set by the organizers for the authors and the reviewers of the conference:**

## **Scientific Committees**

Scientific committees consisting of experts in the fields are established. The committees oversee the peer-review and publication process. To see the scientific committee members, please follow the link: [Scientific Committee](#)

## ***Equality and Decisions***

One or more reviewer, scientific committee member, or chair, (internal or external), are responsible for evaluating the relevance of the submitted manuscripts to the proceedings, technical and scientific merit, originally, and impact. These evaluations are to be carried out regardless of ethnicity, religion, gender, sexual orientation, political beliefs, and institutions. Successive to peer-review, the Chair has full authority and is solely responsible for the published content and the process thereof.

## ***Confidentiality***

Scientific committee member(s) and publishing staff may not disclose manuscripts or their content, directly or indirectly, to anyone other than individuals invited to review the manuscript (whether they accept or not), other reviewers of the same publications, and publishing staff.

## ***Conflicts of Interest***

Scientific committee member(s) and publishing staff may not utilize the contents of submitted manuscripts whether accepted or rejected, directly or indirectly for their own research purposes without prior written consent by the authors.

# ETHICS & MALPRACTICE

## Reviewers

### ***Contribution to Decisions***

In order for final decisions to be made regarding acceptance or rejection of papers, we rely on peer-review. Peer-review is the process of experts in the field reading, understanding, and objectively commenting on submitted papers. Through peer-review, scholars give back to the academic and scientific community by helping the chair(s) make decisions regarding manuscripts.

### ***Promptness***

Reviewers should promptly notify the chair(s) if they are unable or unqualified to carry out their reviewing duties. Reviewers should do their best to provide the reviews to the chair(s) as promptly as possible, and within the designated time-frame.

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The reviewer should notify the chair(s) if they find any similarities in the paper being reviewed and any other work that has been published previously.

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Reviewers must not share the contents of the manuscripts they receive for review, regardless of their decision to review or contents of the review, directly or indirectly, with anyone other than the person who has assigned the review.

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Invited reviewers should immediately inform the chair(s) in case of a conflict of interest based on competitive, collaborative, personal, family, and other relationships with the authors or people involved in the work.

# ETHICS & MALPRACTICE

## **Authors**

### ***Reporting Standards***

The paper being submitted for the proceedings should be based on clear objective, discussion, and references. The findings, data, and the arguments being used in the paper should be accurate. It is author's responsibility to guarantee the authenticity of the data in the paper.

### ***Authorship***

Only persons who have significantly contributed to the work and the manuscript can be named authors on a paper. These contributions include the idea/concept, design, experiments, evaluation, analysis, drafting or revision of the manuscript, and others. Authors must all have agreed to be named as such and for the manuscript to be submitted. Anyone who has contributed based on the above, but the level of contribution is not significant, may appear in the acknowledgement section of the manuscript.

### ***Acknowledgement of Source***

Acknowledgement to other's work being used in the paper must be given at all times. Authors of the paper should give comprehensive credit where it is necessary, by citing the work, they use for supporting their own research.

### ***Accuracy, Originality, and Plagiarism***

Authors should describe their work and the results of their work accurately and in full. The level of provided accuracy and detail should be such that a reader can replicate the work independently. Inaccurate, incomplete, fraudulent, and misleading statements are considered unacceptable and unethical. Direct or indirect use of other people's work is not allowed, unless properly cited. Previous works that have influenced the current work should also be cited. Presenting someone else's work as one's own is strictly prohibited and is considered plagiarism.

### ***Data and Material***

Authors are encouraged to share their data, software, or other sharable material online, provided copyright and ownership laws surrounding that particular project permit. Authors may also be asked to share such material with the chair(s), and/or reviewers, and must be willing to do so if asked.



# ETHICS & MALPRACTICE

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## ***Conflicts of Interest***

Authors must notify the chair(s) at the time of submission, if any factor outside the scope of the research has influenced any step of the work and manuscript writing. Examples of such factors include but are not limited to funding, grants, advisory and consultancy, stock ownership, current or past employment, and memberships, among others. All funding sources should be disclosed in the manuscript.

## ***Animal and Human Subjects***

Works involving human and/or animal subjects must ensure that the work has abided by institutional guidelines, and pre-approved by required bodies. Moreover, consent must be acquired from participants, and privacy of subjects must be ensured. All of the above must be specified with clear statements in the manuscript.

## ***Hazardous Material***

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## ***Reporting of Mistakes, Errata, and Retractions***

If an author identifies a major error in a published paper, he/she must immediately inform the publisher. Regardless of whether a significant error is reported by the authors of the work or other readers, authors are obligated to take the necessary steps to correct the issue. It is decided on a case-by-case basis whether an erratum will be submitted to notify future readers of the error and correction, or whether the paper will be retracted. Unethical/plagiarism issues mostly result in a retraction, while unintended mistakes will mostly result in the publication of an erratum.

# ETHICS & MALPRACTICE

## **Publisher**

### ***Errata and Retractions***

The publisher takes the necessary steps to prevent mistakes, academic and scientific misconduct, and unethical behavior, both intended and unintended. When mistakes are reported, the publisher works with chair(s) and authors to publish an erratum clarifying the issue. In cases where the mistakes are severe and significant, the paper might be retracted. If unethical behavior, plagiarism, academic and scientific misconduct, or other such activities are proven to have taken place by an author or authors, the publisher will retract the paper.

### ***Content and Archiving***

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### ***Ownership and Management:***

This conference-proceedings is managed and operated by the International ASET (International Academy of Science, Engineering, and Technology) and Avestia Publishing (the publishing arm of ASET).

### ***Schedule:***

This conference proceeding accompanies the conference, meaning a new proceedings will be published every year for the corresponding annual conference of this series.

# CONTACT US

For inquiries and to obtain further information on the congress, please visit the [website](#)

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