



EHST
2023

**PROCEEDINGS OF THE 7th
INTERNATIONAL CONFERENCE
ON ENERGY HARVESTING, STORAGE,
AND TRANSFER (EHST 2023)**

June 07 - 09, 2023 | Carleton University, Ottawa, Canada

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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 7th International Conference of Energy Harvesting, Storage, and Transfer (EHST 2023).

EHST 2023 is aimed to become one of the leading international annual conferences in the fields related to energy harvesting, storage, and transfer. This conference will provide excellent opportunities to the scientists, researchers, industrial engineers, and university students to present their research achievements and to develop new collaborations and partnerships with experts in the field.

EHST is a series of international conferences held yearly. These conferences focus on all aspects of Energy Harvesting, Storage, and Transfer. The 7th International Conference of Energy Harvesting, Storage, and Transfer (EHST 2023) is going to be held in a hybrid format, i.e. in person as well as online.

In the seventh meeting of this conference, one plenary speaker and one keynote speaker will share his 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 11 papers will be presented from professors, students, and researchers across the world.

We thank you for your participation and contribution to the 7th International Conference of Energy Harvesting, Storage, and Transfer (EHST 2023). We wish you a very successful and enjoyable experience.

Dr. Boguslaw Kruczek

*Conference Chair and Proceedings Editor
EHST 2023*

Dr. Wael H. Ahmed

*Conference Co-Chair and Proceedings Editor
EHST 2023*

Dr. Xianshe Feng

*Conference Co-Chair and Proceedings Editor
EHST 2023*

ABOUT EHST 2023

The 7th International Conference of Energy Harvesting, Storage, and Transfer (EHST 2023) aims to become the leading annual conference in fields related to energy harvesting, storage, and transfer. The goal of EHST 2023 is to gather scholars from all over the world to present advances in the fields related to energy harvesting, storage, and transfer 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.

These conferences focus on all aspects of Energy Harvesting, Storage, and Transfer. After successfully holding EHST'17 to EHST'22 in Canada, EHST 2023 is hosted in **Carleton University, Ottawa - Canada** as well this year. EHST 2023 is going to be held in a hybrid format, i.e. in person as well as online.

EHST is an acronym for **E**nergy, **H**arvesting, **S**torage, and **T**ransfer.

All papers were peer-reviewed

The conference proceedings are published under an ISSN and ISBN number

Each paper is assigned a unique DOI number by [Crossref](#)

The conference proceedings are indexed by [Google Scholar](#)

The proceedings are permanently archived in [Portico](#) (one of the largest community-supported digital archives in the world)

 Google Scholar

 Crossref

 PORTICO

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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 EHST 2023 Conference:

Scientific Committee Chairs



Dr. Boguslaw Kruczek
University of Ottawa, Canada
Conference Chair



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



Dr. Xianshe Feng
University of Waterloo, Canada
Conference Co-Chair

Scientific Committee Members

- **Dr. Ilinca Adrian**, Université du Québec à Rimouski, Canada
- **Dr. Aicheng Chen**, University of Guelph, Canada
- **Dr. Akhtar Hussain**, University of Alberta, Canada
- **Dr. Lin Liu**, The University of Kansas, USA
- **Dr. Sylvie Lorente**, INSA Toulouse, France
- **Dr. Amir H Mohammadi**, University of KwaZulu-Natal, South Africa
- **Dr. Sebastien Poncet**, University of Sherbrooke, Canada
- **Dr. SA Sherif**, University of Florida, USA
- **Dr. Ali Tarokh**, Lakehead University, Canada

PLENARY & KEYNOTE SPEAKERS

The keynote information for the 7th International Conference of Energy Harvesting, Storage, and Transfer (EHST 2023) is as follows:

Plenary Speaker



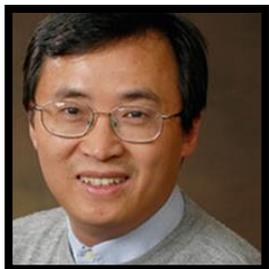
[Dr. Ximing Cai](#)
University of Illinois, USA

Keynote Speaker



[Dr. Ursula Eicker](#)
Concordia University, Canada

EHST 2023 PLENARY SPEAKER



Titles: Stakeholder Synergy for Cellulosic-based Bioeconomy in the United States
[Dr. Ximing Cai, University of Illinois, USA](#)

[View Abstract](#)

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Professor Ximing Cai is a leading scholar in environmental sustainability assessment with biofuel development. Cai group published the first paper on global marginal land availability assessment for biomass production (Cai et al. 2004; Environ. Sci. and Technology – EST, doi:10.1021/es103338e) and a recent paper on water requirement and availability for biorefinery in the United States (Yang et al. 2022, EST, doi: 10.1021/acs.est.1c07747). Besides resources availability assessment, he has also worked on infrastructure requirement for regional biofuel development (Housh et al. 2014, J. of Infra. Sys. doi:10.1061/(ASCE)IS.1943-555X.0000238). Recently, Cai group has analyzed the stakeholders' synergy for bioeconomy (Leibensperger, et al. 2021 doi: 10.1016/j.rser.2020.110613) and developed a bioenergy community communication model – an agent-based model simulating the behaviors and interactions among multiple stakeholders including biomass producers, refinery industries, rural communities, government agencies, and NGOs (Yang et al. 2022, Renew. & Sust. En. Rev., doi: 10.1016/j.rser.2022.112745). He served as Section Editor, Biofuel, Current Sustainability/Renewable Energy Reports, 2014. He is elected Fellow of Am. Geo. Union (AGU) and the 2023 awardee of Am. Sco. of Civil Engineers (ASCE) Julian Hinds Award. He has worked as consultant to the World Bank, United Nations, and other international agencies. Before joining the faculty of the University of Illinois in 2003, Professor Cai was Research Fellow at the International Food Policy Research (IFPRI) Institute in Washington, D.C. He holds B.S. in Water Resources Engineering (1990) and M.S. in Hydrology and Water Resources (1994) from Tsinghua University, Beijing, and Ph.D. in Water Resources Engineering (1999) from the University of Texas at Austin.

EHST 2023 KEYNOTE SPEAKER



Titles: On The Role of Thermal Storage for Demand Response in Building Clusters

[Dr. Ursula Eicker, Concordia University, Canada](#)

[View Abstract](#)

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Since June 2019, she leads an ambitious research program to establish transformation strategies toward zero-carbon cities. Around 50 graduate students work on decarbonisation pathways in the domains of the built environment, renewable energy systems, sustainable transport and circular economy. An urban data analysis and modeling framework integrates the multidisciplinary work. The 7 year research program received 10 million CAD government funding and is supported by a further 10 million Dollars by Concordia University. In November 2020, Prof. Eicker founded Concordia's Next Generation Cities Institute, which groups 14 university research centers and 200 researchers from all faculties. Three interdisciplinary research clusters deal with Built and Natural Environments as the hardware, Mobile, Secure and Sharing Cities as the software and Design, Arts, Culture and Community as the experience of the city. The Institute addresses the challenges of the urban transformation with a transdisciplinary approach and develops tools and strategies for a sustainable future. Prof. Eicker has published 7 Books, 24 book contributions, 128 Peer Reviewed Papers and 335 Conference Papers.

LIST OF PAPERS

The following papers were presented at the 7th International Conference of Energy Harvesting, Storage, and Transfer (EHST 2023).

Renewable Energy

[A Bifunctional Electrochemical Flow Cell Integrating Ammonia Production and Electricity Generation](#)

Authors: Zhefei Pan, Yun Liu, Liang An

[Deep Learning-Based Models for Wind and Solar Curtailment Forecasting](#)

Authors: Hengameh Hadian, Farnoosh Naderkhani

Energy Storage

[Online State-Estimation of Lithium-Ion Battery's Operational States Using the Electrochemical Model Based Nonlinear Kalman Filter](#)

Authors: Pouya Hashemzadeh, Martin Désilets, Marcel Lacroix

[Numerical Modelling of a Phase Change Material-based Shell and Tube Thermal Energy Storage Unit](#)

Authors: Mansoureh Khaljani, Arslan Saleem, Hector Bastida, Jose Munoz Criollo, Carlos E. Ugalde-Loo, Robert Smart, Nick Jenkins

[Free Standing Mixed Matrix Membranes for Carbon Capture](#)

Authors: Suboohi Shervani, Lara P. Tansug, F. Handan Tezel

[Vermiculite/LiCl Composite for Adsorption Thermal Energy Storage](#)

Authors: Suboohi Shervani, Curtis Strong, F. Handan Tezel

[Torsion Spring-Based Mechanical Energy Storage for Renewable Energy Systems: Design and Performance Evaluation](#)

Authors: Liam Crabtree, Liam Easterbrook, Jonas Hill, Adam Leitch, Mostafa H. Sharqawy

LIST OF PAPERS

The following papers were presented at the 7th International Conference of Energy Harvesting, Storage, and Transfer (EHST 2023).

Fluid Flow & Heat Transfer

[A Cold-Start Free Fuel Cell Fed with a Rechargeable “Gasoline”](#)

Authors: Xingyi Shi, Xiaoyu Huo, Liang An

[Study of the Influence of Rock Mechanical Parameters on the Wellbore Stability under Depleted Reservoir Condition](#)

Authors: Zhonghui Li, Arnaud Regis Kamgue Lenwoue, Xuesong Xing, Pengjie Hu, Wentie Sun, Shi Ding

[Flexible Nanogenerators based on Piezoelectric PVDF-TrFE Nanocomposites Poled by DC Magnetic Field](#)

Authors: Marco Fortunato, Alessio Tamburrano and Maria Sabrina Sarto

Poster Session

[Biomass Waste to Energy for a Particleboards Industry](#)

Authors: Tesafaldet Gebreegziabher, Filimon Gebreeyesus

SPONSORS

International ASET Inc. would like to thank the following sponsors for their support of EHST 2023:



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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.

This journal has adopted to the open-access model, meaning all free access to the journal's 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. 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 website for the respected journal: **JFFHMT:** <https://jffhmt.avestia.com>

EHST 2024

The 8th International Conference on Energy Harvesting, Storage, and Transfer (EHST 2024) will be held on June, 2024 in Canada.



For inquiries and to obtain further information on the congress, please visit the [website](http://www.2024.ehstconference.com)

You can also email info@ehstconference.com or

call us at: +1-613-834-9999

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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.

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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.

Acknowledgment of Source

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.

Confidentiality

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.

Fairness

Reviewers should review manuscripts fairly and objectively, with supporting evidence or arguments, regardless of personal feelings or biases.

Conflicts of Interest:

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.

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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.

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Dual Submissions

Submitting a manuscript to more than one venue (conference, journal, etc) simultaneously is not allowed. Presenting previously published work to be considered as a new submission, without a significant new interpretation or analysis, is prohibited.

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

It should clearly be identified in the manuscripts if the works have involved hazardous chemicals and material, or devices that can be harmful.

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

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Schedule:

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

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