



# ICESA 2024

## Proceedings of the 5th International Conference on Environmental Science and Applications (ICESA 2024)

NOVEMBER 18 - 20, 2024 | LISBON, PORTUGAL

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# INTRODUCTION

**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 Environmental Science and Applications (ICESA 2024).**

**ICCEFA 2024** is aimed to become one of the leading international annual conferences in the fields related to environmental science and applications. 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.

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 33 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 Environmental Science and Applications (ICESA 2024)**. We wish you a very successful and enjoyable experience.

**Dr. Mehrab Mehrvar**  
**Toronto Metropolitan University, Canada**  
*Conference Chair*  
*ICCEFA 2024*

**Dr. Zhi Chen**  
**Concordia University, Canada**  
*Conference Chair*  
*ICCEFA 2024*

**Dr. Charles Lee**  
**The University of Newcastle, Singapore**  
*Conference Chair*  
*ICCEFA 2024*

**Dr. Maria Idália da Silva Gomes**  
**Instituto Superior de Engenharia de Lisboa, Portugal**  
*Conference local Chair*  
*ICCEFA 2024*

# ABOUT ICESA'24

**The 5<sup>th</sup> International Conference on Environmental Science and Applications (ICESA 2024) aims to become the leading conference in fields related to Environmental Science and Applications.** The goal of ICESA 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.

ICESA is an international conference will be held yearly. This conference focus on all aspects Environmental Science and Applications. ICESA Will be held this year as a hybrid conference

**ICESA** is an acronym for **I**nternational **C**onference, on **E**nvironmental **S**cience and **A**pplications.

The proceedings are published in Ottawa, Canada.

All papers were peer-reviewed

The conference 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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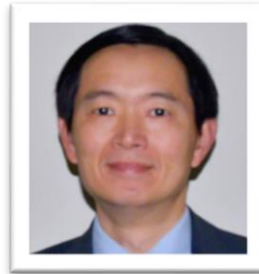
# SCIENTIFIC COMMITTEE

We would like to thank the following for accepting to act as a member of the Scientific Committee for the ICESA'24 Conference:



**Dr. Mehrab Mehrvar**

Toronto Metropolitan University, Canada  
Conference Chair



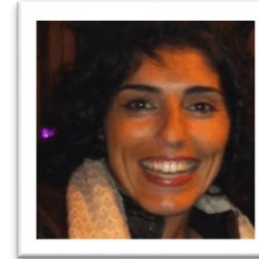
**Dr. Zhi Chen**

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Conference Chair



**Dr. Charles Lee**

The University of Newcastle, Singapore  
Conference Chair



**Dr. Maria Idália da Silva Gomes**

Instituto Superior de Engenharia de Lisboa, Portugal  
Conference Local Chair

## Scientific Committee Members

- **Dr. James Ball**, University of Technology Sydney, Australia
- **Dr. Mohamed Benghanem**, Islamic University of Madinah. Saudi Arabia
- **Dr. Bing Chen**, Memorial University of Newfoundland, Canada
- **Dr. Ahmed Abdullah Daabo**, The University of Mosul, Iraq
- **Dr. Hilal El Hassan**, United Arab Emirates University, UAE
- **Dr. Gordon Huang**, University of Regina, Canada
- **Dr. Mohammad Arif Kamal**, Aligarh Muslim University, India
- **Dr. Ahmed Karmaoui**, Moulay Ismail University, Morocco
- **Dr. Richa Kothari**, Central University of Jammu, India
- **Dr. Woo Hyong Lee**, University of Central Florida, USA
- **Dr. Charles Lee**, The University of Newcastle, Singapore
- **Dr. Lucy Semerjian**, University of Sharjah, UAE

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# PLENARY & KEYNOTE SPEAKERS

The plenary and keynote information for The 5th International Conference on Environmental Science and Applications (ICESA'24) is as follows:

## Plenary Speaker



**Dr. Mehrab Mehrvar**

Toronto Metropolitan University, Canada

## Keynote Speaker



**Dr. Ali Altaee**

University of Technology in Sydney,  
Australia

## PLENARY SPEAKER



**Title:** Integration of Processes for Wastewater Treatment: Trend, Advances, and Future  
**Dr. Mehrab Mehrvar**, Toronto Metropolitan University, Canada

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Dr. Mehrab Mehrvar, Ph.D., P.Eng., joined Toronto Metropolitan University in Canada in 1998, where he is now Full Professor, Interim Associate Dean of the Faculty of Engineering and Architectural Science, and Associate Chair for Graduate Studies in the Department of Chemical Engineering. He received his Ph.D. in Chemical Engineering from the University of Waterloo, Canada. Dr. Mehrvar is deeply committed to research, with primary interests in integrating advanced oxidation technologies and biological processes for water and wastewater treatment, as well as in photochemical reaction engineering. He has authored or co-authored one patent, over 134 refereed journal papers, six book chapters, 37 conference proceedings papers, and more than 250 conference presentations and invited seminars. Over his career, Dr. Mehrvar has supervised or co-supervised more than 55 graduate students at the master's and doctoral levels, as well as over 80 research assistants, exchange students, postdoctoral fellows, and visiting scholars. He has also served as a guest editor and as an editorial board member for several refereed journals. Additionally, he has chaired and participated as an organizing and scientific committee member in numerous international conferences. Dr. Mehrvar has taught a variety of courses in Chemical and Environmental Engineering at both undergraduate and graduate levels and previously served as the Department Chair for a couple of years. He has received multiple prestigious teaching and research awards from both the University of Waterloo and Toronto Metropolitan University.

## KEYNOTE SPEAKER



**Title:** Iron Slag/Activated Carbon-Electrokinetic System With Anolyte Recycling For Single And Mixture Heavy Metals Remediation

**Dr. Ali Altaee**, University of Technology in Sydney, Australia

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Dr Ali Altaee works at the forefront of renewable energy, water engineering, and soil remediation, developing innovative technologies in alternative energy and water sources. Ali is a member of the UTS Centre for Green Technology (CGT) and the Centre for Technology in Water and Wastewater (CTWW), a leading research center in alternative water sources. He has developed industrial and academic expertise working at industrial research centers and institutes of higher education and has particular research expertise in advanced materials for energy and environmental applications.



# LIST OF PAPERS

The following papers were presented at the 5th International Conference on Environmental Science and Applications (ICESA'24):

## Environmental Sustainability and Development

### **An Integrated Arduino UNO WiFi Microcontroller as an IoT-Enabled Smart Household Hydroponic System**

Authors: Ley Wei En, Chong Lye Lim, Yit Yan Koh, Charles C.C Lee

### **Design of a Kinetic Power Charger Integrated with a Portable Exercise Device**

Authors: Thanasitsomboon Siradanai, Chong Lye Lim, Yit Yan Koh, Charles C.C Lee

### **Harnessing Technology for Climate Resilience: A New Paradigm in Urban Cooling through Eco-friendly Cooler**

Authors: Ahmed Faizul Haque Dhruvo, Md. Saad Bin Sayed, Labiba Faizah, Samiur Rahman Alif, Md. Mohibul Islam, Farhana Sharmin, Mohammad Abdul Qayum

### **Mapping Wetland Ecosystems Based on Satellite Geographical Landscape Data (Case Study in Ninh Binh Province)**

Authors: Son Nguyen Phi, Huong Nguyen Thi Thanh, Thuy Nguyen Thanh, Thanh Dinh Thi

### **Comparative Analysis of Sustainable Cattle Manure Management Alternative Practices in Kuwait**

Authors: Abdalrahman Alsulaili, Mohammed Azab, Maraheb Al-Thafeery

### **Enhanced Analysis of Key Marine Nutrients in High-Salinity Seawater Using Ion Chromatography**

Authors: Nabiazam Sayed, Dibin Bhasi, Abdul Raheem, Shanid Thayyil, Dr Parth Gupta, Samara Bin Salem, Dr Wael Elamin, Dr Grzegorz Brudecki

# LIST OF PAPERS

## Environmental Sustainability and Development

### **The State Of Development of Hydropower in the Bóbr River Catchment in Poland**

Authors: Paweł Tomczyk, Mirosław Wiatkowski

### **Monitoring Changes Occurring On the Substrates in Constructed Wetlands Fed With Landfill Leachate**

Authors: Aleksandra Wdowczyk

### **Sustainability in Higher Education Institutions: The Key Role of Eco-Schools**

Authors: Sara Sousa

### **Analysis of selected pharmaceuticals and personal care products (PPCPs) in selected waste water treatment plants in Eswatini**

Authors: Rose Kibechu, Thabile Ndlovu, Gugu Sibandze

### **Evapotranspiration tanks for blackwater treatment in a community settlement of Izidora Stream Basin in Brazil**

Authors: João Paulo Ferreira, Luis Alberto Sáenz Isla, Maria Rita Scotti

### **Metal Recovery from Spent Lithium-ion Batteries by Adsorption Process**

Authors: João Braga, Juliana Sousa

### **Modeling and Optimization of Thermal Dynamics for MPC Models in Sustainable Building Energy Systems**

Authors: Robin Fick, Julian Knopp, Robert Honke

# LIST OF PAPERS

## Environmental Sustainability and Development

### **Contaminants Release by Biodegradable and Conventional Mulching Films into Agricultural Soils and Crops**

Authors: Costanza Scopetani, A. Bellabarba, G. Selvolini, T. Martellini, F. Ricciardi, L. Galli, C. Viti, A. Adessi, G. Marrazza, A. Cincinelli

### **Biodrying of Food Waste-Rich Municipal Solid Waste for Enhanced Incineration Efficiency**

Authors: Fatma Ece SAYIN, İsmail ÖZBAY, Recep Kaya GÖKTAŞ, Barış ÇALLI, Bilge ÖZBAY

### **Automatic Identification of Aquatic Insects Based On Deep Learning and Computer Vision**

Authors: Predrag Simović, Katarina Stojanović, Dimitrija Savić-Zdravković, Aleksandar Milosavljević, Milena Radenković, Ana Petrović, Bratislav Predić, Milenka Božanić, Djuradj Milošević

### **Assessment of Personal Exposure to Particulate Matter among Traffic Policemen and Industrial Workers in Surat, India**

Authors: Madhumita Chakraborty, Smaranika Panda, Robin A Christian

### **Optimizing Wastewater Management in Kuwait: Characterization of Treatment Parameters**

Authors: Abdalrahman Alsulaili, Fahad M. Al-Fadhli, Omar Ali, Nasser Alenezi

# LIST OF PAPERS

## Environmental Sustainability and Development

**A Cross-Sectional Study on the Causes, Impacts, And Management of Food Waste in Selected Small Business Establishments within the Emfuleni Local Municipality, Gauteng Province**

Authors: Hlamalani D. Maluleke, Shalin Bidassey-Manilal, Thokozani P. Mbonane

**Development of Innovative and Sustainable Methodologies Applied To the Recovery of Gold and Critical Elements in Integrated Circuit Boards**

Authors: Lídia Cunha, Joana Monteiro, Andreia Azevedo, Aurora Futuro, José Soeiro, Rui Sousa

**A Framework for Modular Treatment of Industrial Effluent and Modular Environmental Life Cycle Assessment of the Treatment Scenarios**

Authors: Tara Soleimani, Gaetano Zuccaro, David Lopez Ferber, Guillaume Junqua, Miguel Lopez Ferber

# LIST OF PAPERS

## Posters Session

**Assessment of Cytotoxic Effects of Chronic Exposure to Copper and Cadmium in Hemolymph and Midgut Glands of the Steatoda Grossa (Theridiidae) Spider**

Authors: Grażyna Wilczek, Elżbieta Szulińska, Joanna Homa, Magdalena Rost-Roszkowska, Łukasz Chajec

**Reference Vertical Multifamily Building in Mexican Climates Using the Synthetical Average Building Approach**

Authors: Carlos A. Espino-Reyes, Naghelli Ortega-Ávila, Ricardo Beltrán-Chacón, Norma A. Rodríguez-Muñoz

**Regional Bricks Thermal Analysis: A Low-Thermal Conductivity Material to Reduce Carbon Emissions**

Authors: Luis Roberto Hernández-Nájera, Ana Cecilia Borbón-Almada, J. Rafael Irigoyen Campuzano, Norma A. Rodríguez-Muñoz

**Case Study Of The Cooling Effect Of Trees In The Metropolitan Area Of The Valley Of Mexico In The Context Of The Urban Heat Island**

Authors: Juan Manuel Núñez, Andrea Paola Pérez-Rojas, Andrea Santamaría

**Experimental Results from Anaerobic Co-Digestion of Corn Steep Liquor and Agricultural Wastes for Biohydrogen Production**

Authors: Elena Chorukova, Neven Dimitrov, Snezhanka Mihaylova

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## Posters Session

### **Composition of EPS in biofilm depending on type of treated wastewater**

Authors: Paulina Rusanowska, Magda Dudek, Marcin Zieliński

### **Effects of Phenolic Compounds on Methane Production from Maize Silage**

Authors: Magda Dudek, Anna Nowicka

### **Hydrogen production via *Platymonas subcordiformis* in different CO<sub>2</sub> concentration conditions**

Authors: Marcin Dębowski, Marcin Zieliński, Paulina Rusanowska, Łukasz Barczak, Adam Starowicz, Magda Dudek

### **Influence of Phenolic Compounds on the Process of Anaerobic Digestion from Basket Willow (*Salix viminalis*)**

Authors: Anna Nowicka, Marcin Zieliński

### **Analysis of environmental risks and genetic predisposition to the development of bronchial asthma among residents of Almaty**

Authors: Madina Abdullayeva, Nazym Altynova, Saida Tokmurzina, Lyazzat Musralina, Aigerim Kassymbekova, Yergali Kanagat, Dmitri Gourevitch, Danara Artygaliyeva, Leyla

# LIST OF PAPERS

## Posters Session

### **Efficiency of Photosynthetic Microbial Fuel Cell (Pmfc) Depending On Microalgae Species Inhabiting the Cathode Chamber**

Authors: Marcin Zieliński, Paulina Rusanowska, Magda Dudek, Adam Starowicz, Łukasz Barczak, Marcin Dębowski

### **A Systematic Review to Determine the Association between Childhood Lead Exposure and Cognitive Abilities of Adolescents and Young Adults**

Authors: Michael Makhetha, Thokozani P Mbonane

### **In-Depth Investigation on the Occurrence of Per- And Polyfluoroalkyl Substances (Pfas) In Greek Home-Produced Chicken Eggs through Lc-Ms/Ms Analysis**

Authors: O. S. Arvaniti, T.D. Gerokonstantis, C. Bouzoukas, M. Kostakis, N. Diakakis, M. Aloupi, M. Dasenaki, N. S. Thomaidis, A. S. Stasinakis

# SPONSORS

International ASET Inc. would like to thank the following sponsors for their support of ICESA'24:



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# ICESA 2025

The 6th International Conference on Environmental Science and Applications (ICESA 2025) will be held on October 27 - 29, 2025 in Barcelona , Spain.



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

You can also email [info@esaconference.com](mailto:info@esaconference.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 International Journal of Environmental Pollution and Remediation (IJEPR)**

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 IJEPR 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:  
IJEPR: <https://ijepr.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.

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# 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.

### ***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.

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### ***Fairness***

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### ***Conflicts of Interest:***

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# ETHICS & MALPRACTICE

## ***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.

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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.

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# ETHICS & MALPRACTICE

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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.

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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.

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# ETHICS & MALPRACTICE

## Publisher

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

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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.

# CONTACT US

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

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+1-613-834-9999

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