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On behalf of the International Academy of Science, Engineering and Technology (International ASET Inc.), the organizing committee would like to welcome you to the International Conference on Advances in Energy Research and Applications (ICAERA'21).

The goal of ICAERA'21 is to provide an online space for scholars from all over the world to present advances in the relevant fields and to foster a virtual 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 second meeting of this conference, one plenary speaker and one keynote speaker 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 International Conference on Advances in Energy Research and Applications (ICAERA'21). We wish you a very successful and enjoyable experience.

Dr. Boguslaw Kruczek  
University of Ottawa, Canada  
Conference Chair  
ICAERA'21
The 2nd International Conference on Advances in Energy Research and Applications (ICAERA'21) aims to become the leading conference in fields related to Energy Research and Applications. The goal of ICAERA'21 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'21 is an international conference will be held yearly. This conference focus on all aspects Energy Research and Applications. ICAERA'21 Will be held this year in Virtual conference

ICAERA'21 is an acronym for International Conference, on Energy Research and Applications.

- 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)
We would like to thank the following for accepting to act as a member of the Scientific Committee for the ICAERA’21 Conference:

**Scientific Committee Members**

- **Dr. Abdessattar Abdelkefi**, New Mexico State University, USA
- **Dr. Kun (Kelvin) Fu**, University of Delaware, USA
- **Dr. Wei Lu**, University of Michigan, USA
- **Dr. Gowtham Mohan**, The University of New Mexico, USA
- **Dr. Santosh Shrestha**, University of New South Wales, Australia
- **Dr. Ismail Solamaz**, Atatürk University, Turkey
- **Dr. Khin Zaw**, National University of Singapore, Singapore

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

**Dr. Jiheong Kang**  
KAIST, South Korea  
local Committee Member
PLENARY/KEYNOTE SPEAKERS

The keynote information for the 2nd International Conference on Advances in Energy Research and Applications (ICAERA'21) is as follows:

Plenary Speaker

Dr. Nam-Gyu Park
Sungkyunkwan University, South Korea

Keynote Speaker

Dr. Michele Guala
University of Minnesota, USA
Nam-Gyu Park is Distinguished professor and SKKU-Fellow in School of Chemical Engineering at Sungkyunkwan University (SKKU). He received his B.S. degree in chemical education, M.S. and Ph.D. degrees in chemistry from Seoul National University in 1988, 1992 and 1995, respectively. He worked at ICMCB-CNRS, France, from 1996 to 1997 and at National Renewable Energy Laboratory, USA, from 1997 to 1999 as postdoctoral researchers. He was director of solar cell research center at Korea Institute of Science and Technology (KIST) from 2005 to 2009 and principal scientist at Electronics and Telecommunications Research Institute (ETRI) from 2000 to 2005 before joining SKKU as a full professor in 2009. He is a fellow of Korean Academy of Science and Technology (KAST) since 2017. He has been working on high efficiency mesoscopic nanostructured solar cells since 1997. He is pioneer of solid-state perovskite solar cell, which was first developed in 2012. He was selected as a New Class of Nobel Prize-Worthy Scientist in September 20, 2017 and included in highly cited researchers (HCR, top 1% scientists) in 2017, 2018, 2019 and 2020 by Clarivate Analytics. He received awards including Scientist Award of the Month (2008), KIST Award of the Year (2009), Dupont Science and Technology Award (2010), SKKU fellowship (three times in 2013, 2018 and 2021), PVSEC Hamakawa Award (2015), Dukmyung KAST Engineering Award (2016), ACS-KCS Excellence Award (2018), Ho-Am Prize (Samsung, 2018) and Rank Prize (UK, 2022). Prof. Park has currently more than 342 refereed publications and more than 70 patents. He received H-index of 102 (google scholar). He is Senior Editor of ACS Energy Letters and serves on the Editorial Advisory Board for Chem. Rev., ChemSusChem, and Solar RRL.
Michele Guala is an associate professor in the Department of Civil, Environmental and Geo Engineering, graduate faculty in the Department of Mechanical Engineering, and the Associate Director for Research at the St. Anthony Falls Laboratory, University of Minnesota.

**Title:** In-Stream Hydrokinetic Turbines for Sustainable Energy Conversion

**Dr. Michele Guala, University of Minnesota, USA**

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# LIST OF PAPERS

The following papers were presented at the 2\textsuperscript{nd} International Conference on Advances in Energy Research and Applications (ICAERA’21)

## Renewable & Sustainable Energies

| Title: Fuel Efficiency Improvement of Rule-based Algorithm for P0 Mild Hybrid Electric Vehicle |
| Authors: In-Gyu Jang, Sung-Ho Hwang |
| View Paper |

| Title: Techno-Enviro-Economic Assessment of a Solar Powered Cooler for Cauliflower Storage in Nanded District, India |
| Authors: Jimena Díaz, Prashant Govande, Kapil Narwal, Paul G. O’Brien |
| View Paper |

| Title: Performance Optimization of the Gasification Process by using Equilibrium Model and Dragonfly Algorithm |
| Authors: Adityabir Singh, Ranjan Das |
| View Paper |

| Title: Stability Analysis of Salt-gradient Solar Pond under External Heat Addition with Different Salts |
| Authors: Abhishek Kumar, Ranjan Da |
| View Paper |
# LIST OF PAPERS

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## Renewable & Sustainable Energies

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International ASET Inc. would like to thank the following sponsors for their support of ICAERA'21:
The 3rd International Conference on Advances in Energy Research and Applications (ICAERA'22) will be held on October 27, 2022 - October 29, 2022 in Seoul, South Korea.

For inquiries and to obtain further information on the congress, please visit the website

You can also email info@icaera.com or call us at:

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The following statement is mainly based on the Code of Conduct and Best-Practice Guidelines for Journal Editors (Committee on Publication Ethics, 2011).

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Scientific Committee

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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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