



INTERNATIONAL INSTITUTE FOR CARBON-NEUTRAL ENERGY RESEARCH

## I<sup>2</sup>CNER THRUST WORKSHOP: TOWARD CARBON NEUTRALITY

ADVANCED ENERGY MATERIALS THRUST (AEM)  
AND MULTISCALE SCIENCE AND ENGINEERING FOR ENERGY AND THE ENVIRONMENT THRUST (MS3E)

DATE: JANUARY 30TH, 2025, THURSDAY

TIME: 9:25AM – 6:00PM(JST)

VENUE: I<sup>2</sup>CNER HALL, ITO CAMPUS, KYUSHU UNIVERSITY

Time	Speaker	Affiliation	Title
9:25 a.m.	Masanobu Kubota	WPI-I <sup>2</sup> CNER, Kyushu University	Opening Remarks
<b>Session 1: Advanced Energy Materials Thrust (AEM)</b> * HYBRID			
9:30 a.m.	Petros Sofronis	University of Illionis at Urbana- Champaign, WPI- I <sup>2</sup> CNER	Powering the Future through Hydrogen Hubs and International Partnerships for Materials and Engineering System Solutions
10:30 a.m.	Mohsen Dadfarnia	University of Illionis at Urbana- Champaign, WPI- I <sup>2</sup> CNER	Mechanistic Model for Hydrogen Accelerated Fatigue Crack Growth in a Low Carbon Steel
10:55 a.m.	Vijayvargia Kshitij	University of Illionis at Urbana- Champaign, WPI- I <sup>2</sup> CNER	On the chemomechanics of bubble growth in hydrogen attack of plain carbon steels
11:20 a.m.	Shang Juan	WPI-I <sup>2</sup> CNER, Kyushu University	Enhanced hydrogen embrittlement of steel by the premature hydrogen dissociation with the increasing inert gas pressure in hydrogen mixtures
11:45 a.m.	Hironori Shinmori	Faculty of Engineering, WPI- I <sup>2</sup> CNER, Kyushu University	Friction and wear of polymer composites in high-pressure hydrogen gas
12:10 p.m.	Qian Chen	HYDROGENIUS, Kyushu University	Effect of trace moisture on the friction and wear of PTFE composites in high purity hydrogen gas environment
12:35 p.m.	Ma Tianze	Graduate School of Kyushu University	Temperature dependence of work- hardening behavior in nitrogen-bearing austenitic steel
<b>Lunch</b>			

Time	Speaker	Affiliation	Title
<b>Session 2: Multiscale Science and Engineering for Energy and the Environment Thrust (MS3E)</b> <b>* ONSITE ONLY</b>			
<b>2:00 p.m.</b>	Hirokazu Kobayashi	K-NETs, WPI-I <sup>2</sup> CNER, Kyushu University	Novel Metal Nanostructured Materials for Energy and Catalysis Applications
<b>2:20 p.m.</b>	Roman Selyanchyn	Q-PIT, WPI-I <sup>2</sup> CNER, Kyushu University	Development of nanomembranes and membrane-base devices for CO <sub>2</sub> capture directly from the air
<b>2:40 p.m.</b>	Seiji Yamazoe	Tokyo Metropolitan University	DAC system using liquid-solid phase-separation and catalytic CO <sub>2</sub> conversion using metal oxide clusters
<b>3:10 p.m.</b>	Naoki Ousaka	K-NETs, WPI-I <sup>2</sup> CNER, Kyushu University	CO <sub>2</sub> separation nanomembranes made of self-healing polymers prepared from $\alpha$ -lipoic acid derivatives
<b>3:30 p.m.</b>	Md. Amirul Islam	WPI-I <sup>2</sup> CNER, Kyushu University	In Situ Metal Impregnation of MOFs: Advancing High-Efficiency Adsorption Heat Pumps and VOC Removal
<b>3:50 p.m.</b> ~ <b>4:10 p.m.</b>	<b>Break</b>		
<b>4:10 p.m.</b>	Kazuhide Kamiya	Osaka University	Electrochemical Conversion of Gaseous CO <sub>2</sub> : From Electrocatalysts to Electrolyzers
<b>4:40 p.m.</b>	Masaki Donoshita	IMCE, WPI- I <sup>2</sup> CNER, Kyushu University	Cooperative Dual Redox Sites in a Dinuclear Cobalt Complex Lower the Overpotential of CO <sub>2</sub> Electroreduction
<b>5:10 p.m.</b>	Ladan Mirchegini	WPI-I <sup>2</sup> CNER, Kyushu University	Strategies for Achieving Carbon Neutrality within the Chemical Industry
<b>5:30 p.m.</b>	Satoshi Horike	Graduate School of Science, Kyoto University	Metal-organic framework glasses and liquids for energy
<b>6:00 p.m.</b>	Shigenori Fujikawa	WPI-I <sup>2</sup> CNER, Kyushu University	Closing Remarks