

# International Workshop of Energy Conversion 2023



## IWEC2023 Program

Kambaikan Building, **Muromachi Campus**,  
**Doshisha University**, Kyoto

< March 15, Wednesday >

### Reception and Welcome party

13:00-18:30      **Reception** at reception desk

19:00-20:30      **Welcome party**

Kambaikan Building, Muromachi Campus,  
Doshisha University



< March 16, Thursday >

### Opening ceremony (Chair: Prof. T. Kuwahara)

09:30-09:40      **Opening**

09:40-09:50      **Opening speech**

Prof. Minoru Inaba

*Director of Energy Conversion Research Center, Doshisha University*

### Session 1: Transportation of Energies and Energy Conversion Systems (Chair: Prof. Y. Iwamoto)

09:50-10:10      **A fractional step lattice Boltzmann method for interfacial behaviors of magnetic multiphase flows**

X. Li<sup>1</sup>, Z.-Q. Dong<sup>1</sup>, X.-R. Zhuang<sup>2</sup>, L.-P. Wang<sup>1</sup>, X.-D. Niu<sup>3</sup>, H. Yamaguchi<sup>4</sup>, P. Yu<sup>1\*</sup>

<sup>1</sup>*Department of Mechanics and Aerospace Engineering, Southern University of Science and Technology, Shenzhen, China*

<sup>2</sup>*School of Mechanical and Electrical Engineering, Shenzhen Polytechnic, Shenzhen*

<sup>3</sup>*College of Engineering, Shantou University, Shantou, China*

<sup>4</sup>*Energy Conversion Research Center, Doshisha University, Kyoto, Japan*

- 10:10-10:30     **Development of La<sub>0.6</sub>Sr<sub>0.4</sub>CoO<sub>3-δ</sub> anode for oxygen generation by molten salt electrolysis**  
 S. Tanaka<sup>1</sup>, Y. Suzuki<sup>1</sup>, T. Fukumoto<sup>2</sup>, T. Goto<sup>2</sup>  
<sup>1</sup>*Office for Research Initiatives and Development, Doshisha University, Kyoto, Japan*  
<sup>2</sup>*Faculty of Science and Engineering, Doshisha University, Kyoto, Japan*
- 10:30-10:50     **Experiment study on the exhaust-gas heat exchanger for small and medium-sized fishing marine diesel engine**  
 G. Xi, X. Wang  
*Nantong Institute of Technology, Nantong, China*
- 10:50-11:10     **Adsorbed CO<sub>2</sub> reduction technique using nonthermal plasma flows**  
 H. Yamasaki<sup>1,2\*</sup>, H. Wakimoto<sup>2</sup>, T. Kuroki<sup>1,2</sup>, M. Okubo<sup>1,2</sup>  
<sup>1</sup>*Department of Mechanical Engineering, Osaka Metropolitan University, Sakai, Japan*  
<sup>2</sup>*Department of Mechanical Engineering, Osaka Prefecture University, Sakai, Japan*
- 11:10-11:30     Coffee break

**Session 2: Keynote lecture** (Chair: Prof. H. Yamaguchi)

- 11:30-12:00     **Numerical simulations of ferrofluid droplets and surface instabilities in ferrofluid layers**  
 X.-D. Niu<sup>1,2</sup>, J.-X. Zhou<sup>1,2</sup>, H.-W. Xiao<sup>1,2</sup>, A. Khan<sup>1,2</sup>, M.-F. Chen<sup>3</sup>, D.-C. Li<sup>4</sup>, H. Yamaguchi<sup>5</sup>  
<sup>1</sup>*Key Laboratory of Intelligent Manufacturing Technology, Shantou University, Guangdong, China*  
<sup>2</sup>*College of Engineering, Shantou University, Guangdong, China*  
<sup>3</sup>*College of Physics and Electromechanics Engineering, Longyan University, Longyan, China*  
<sup>4</sup>*Department of Mechanical Engineering, Tsinghua University, Beijing, China*  
<sup>5</sup>*Energy Conversion Research Center, Doshisha University, Kyoto, Japan*
- 12:00-13:30     Lunch

**Session 3: Energy Conversion and Related Research Topics 1** (Chair: Prof. G. Xi)

- 13:30-13:50     **Medium scale distribution chains for hydrogen**  
 P. Nekså<sup>1,2</sup>, M. Z. Saeed<sup>2</sup>, S. Trædal<sup>1</sup>, I. Snustad<sup>1</sup>, I. Koshelkov<sup>2</sup>, L. D. Jacobsen<sup>2</sup>  
<sup>1</sup>*SINTEF Energy Research, Trondheim, Norway*  
<sup>2</sup>*NTNU, Department of Energy and process engineering, Trondheim, Norway*
- 13:50-14:10     **Recycling of fisheries waste**  
 H. Kobatake, S. Tanaka, Y. Suzuki, T. Goto

*Doshisha University, Kyotanabe, Japan*

14:10-14:30 **Reduction in energy consumption in water purification technology with water**

T. Kuwahara

*Department of Mechanical Engineering, Nippon Institute of Technology, Saitama, Japan*

14:30-14:50 **Heat transport characteristics of a closed two phase thermosyphon by water with air mixed (effect of the internal structure)**

T. Kitamura, T. Kubota, S. Shuchi

*Department of Mechanical Engineering, Akita Prefectural University, Akita, Japan*

14:50-15:10 Coffee break

**Session 4: Keynote lecture** (Chair: Prof. X.-D. Niu)

15:10-15:40 **Centrifugal convection in a bidisperse medium with chemical reaction**

S. Saravanan\*, S. Vigneshwaran

*Centre for Differential Equations and Fluid Dynamics, Department of Mathematics, Bharathiar University, Coimbatore, India*

15:40-15:50 Announcement

18:00-20:30 **Banquet**

Kiyomizu Kyoto Higashiyama

(Shuttle bus from Kambaikan Building)

< March 17, Friday >

**Session 5: Energy Storage and Transportation of CO<sub>2</sub>** (Chair: Prof. P. Neksa)

09:30-09:50 **CERN CO<sub>2</sub> primary cooling – Project roadmap and first operational units**

P. Barroca<sup>1</sup>, A. Hafner<sup>1</sup>, B. Verlaet<sup>2</sup>, P. Hanf<sup>2</sup>

<sup>1</sup>*Norwegian University of Science and Technology (NTNU), Trondheim, Norway*

<sup>2</sup>*European Organization for Nuclear Research (CERN), Geneva, Switzerland*

09:50-10:10 **Performance improvement strategies for CO<sub>2</sub> based experimental Rankine cycle for better sustainability**

S. Celik-Toker<sup>1\*</sup>, O. Kizilkan<sup>1</sup>, H. Yamaguchi<sup>2</sup>

<sup>1</sup>*Department of Mechanical Engineering, Isparta University of Applied Sciences, Faculty of Technology, Isparta, Turkey*

<sup>2</sup>*Department of Mechanical Engineering, Doshisha University, Kyoto, Japan*

10:10-10:30 **Transient boundary heat transfer analysis of a near-critical experimental chamber realized by pixelated phase-shifting interferometry**  
Y.Z. Zhang<sup>1,2</sup>, L. Chen<sup>1,2,3\*</sup>, Q.X. Wu<sup>1,2</sup>, Y. Kanda<sup>4</sup>, A. Komiya<sup>4</sup>, J.G. Zang<sup>5</sup>, Y.P. Huang<sup>5</sup>  
<sup>1</sup>*Institute of Engineering Thermophysics, Chinese Academy of Sciences, Beijing, China*  
<sup>2</sup>*University of Chinese Academy of Sciences, Beijing, China*  
<sup>3</sup>*Innovation Academy for Light-Duty Gas Turbine, Chinese Academy of Sciences, Beijing, China*  
<sup>4</sup>*Institute of Fluid Science, Tohoku University, Sendai, Japan*  
<sup>5</sup>*CNNC Key Laboratory on Nuclear Reactor Thermal Hydraulics, Nuclear Power Institute of China, Chengdu, China*

10:30-10:50 Coffee break

**Session 6: Energy Conversion and Related Research Topics 2** (Chair: Prof. O. Kizilkan)

10:50-11:10 **One-step reduction process of silica to silicon by molten salt electrolysis**  
Y. Suzuki<sup>1</sup>, S. Tanaka<sup>1</sup>, T. Goto<sup>2</sup>  
<sup>1</sup>*Organization for Research Initiatives and Development, Doshisha University, Kyoto, Japan*  
<sup>2</sup>*Department of Science of Environment and Mathematical Modeling Graduate School of Science and Engineering, Kyoto, Japan*

11:10-11:30 **PM removal characteristics in magnetic fluid filter with dielectric barrier discharge**  
Y. Asaka, T. Kuwahara  
*Department of Mechanical Engineering, Nippon Institute of Technology, Saitama, Japan*

11:30-11:50 **Energy harvesting using magnetorheological elastomer dispersing magnetically-hard magnetic particles**  
Y. Iwamoto<sup>1\*</sup>, T. Saiki<sup>1</sup>, Y. Ido<sup>1</sup>, T. Deguchi<sup>2</sup>, T. Tazawa<sup>2</sup>, H. Yamamoto<sup>2</sup>  
<sup>1</sup>*Department of Electrical and Mechanical Engineering, Nagoya Institute of Technology, Nagoya, Japan*  
<sup>2</sup>*KRI Inc., Kyoto, Japan*

11:50-12:10 **Status of clean cooling systems**  
A. Hafner  
*Norwegian University of Science and Technology, Trondheim, Norway*

12:10-13:30 Lunch

**Session 7: Keynote lecture** (Chair: Prof. T. Kuwahara)

13:30-14:00      **Research history for magnetic fluid and CO<sub>2</sub> heat pump system**

H. Yamaguchi

*Energy Research Center, Department of Mechanical Engineering, Doshisha University,  
Kyoto, Japan*

14:00-14:10      Short break

**Closing ceremony** (Chair: Prof. S. Shuchi)

14:10-14:20      **Closing speech**

Prof. Hiroshi Yamaguchi

*Organizer of IWEC 2023, Doshisha University*

14:20-14:30      **Closing**

**General presentation**

Presentation 15 min and Discussion 5 min

**Keynote lecture**

Presentation 25 min and Discussion 5 min

Please note:

- Eating and drinking inside the building is NOT allowed.