

**The Seventeenth
Seoul National - Kyoto - Tsinghua
University
Thermal Engineering Conference**



**October 12 - 14, 2017
Seoul National University, Korea**



<QR code for Three University Thermal Engineering Conference Official Website>

Conference Co-Chairpersons :

Kim, Min Soo	Seoul National University
Yoshida, Hideo	Kyoto University
Liang, Xingang	Tsinghua University

Organized / Sponsored by

Institute of Advanced Machinery and Design, SNU

Global Frontier Center for Multiscale Energy System, SNU

BK21plus Transformative Training Program, SNU

College of Engineering, SNU

Program

October 12, Thursday, 2017

(Advanced Automotive Research Center 2F, Room 211)

15:20 - 15:30 **Registration**

15:30 - 15:40 **Opening & Introduction (Prof. Chongwoo Park, Department Head)**

15:40 - 17:00 **Session 1: Thermal Engineering I (Chair/ Prof. Seung Hwan Ko)**

17:00 - 17:20 < Break >

17:20 - 18:20 **Session 2: Fluid Engineering I (Chair/ Prof. Hyungrok Do)**

18:20 – 20:00 **Dinner** (Rakgujung, Korean Cuisine)

October 13, Friday, 2017

(Advanced Automotive Research Center 2F, Room 211)

09:10 - 10:10 **Session 3: Thermal Engineering II (Chair/ Prof. Kazuya Tatsumi)**

10:10 - 10:30 < Break >

10:30 - 11:30 **Session 4: Fluid Engineering II (Chair/ Prof. Qun Chen)**

11:30 - 13:00 **Lunch** (La Cucina, Engineer House)

13:00 - 13:30 **Facility Tour I** (Advanced Automotive Research Center)

13:30 - 14:00 **Facility Tour II** (Multiscale Energy Center)

14:00 - 15:20 **Session 5: Energy System** (Chair/ Prof. Wontae Hwang)

15:20 - 15:40 < Break >

15:40 - 16:40 **Session 6: Thermal Engineering III** (Chair/ Prof. Han Ho Song)

16:40 - 17:20 **Special Session: Three Asian University Conference – Two**

Decades Collaboration, Future Direction

17:20 - 17:30 **Closing**

19:00 - 21:00 **Conference Banquet** (868 Restaurant, Gang Nam area)

October 14, Saturday, 2017

(Advanced Automotive Research Center 2F, Room 211)

09:30 - 11:00 **Discussion for Future Research Collaboration on**

Thermal/Fluid Engineering

List of Participants from Seoul National University

Seoul 08826, Korea

LEE, Woo Il (李愚日), Professor

Department of Mechanical and Aerospace Engineering, Seoul National University

Phone & Fax: +82-2-880-7116, +82-2-883-1513

E-mail: wilee@snu.ac.kr

CHOI, Mansoo (崔萬秀), Professor

Department of Mechanical and Aerospace Engineering, Seoul National University

Phone & Fax: +82-2-889-6669, +82-2-889-6671

E-mail: mchoi@snu.ac.kr

KIM, Charn-Jung (金燦中), Professor

Department of Mechanical and Aerospace Engineering, Seoul National University

Phone & Fax: +82-2-880-1662, +82-2-883-1513

E-mail: kimcj@snu.ac.kr

MIN, Kyoungdoug (閔庚德), Professor

Department of Mechanical and Aerospace Engineering, Seoul National University

Phone & Fax: +82-2-880-1661, +82-2-883-1513

E-mail: kadmin@snu.ac.kr

RO, Sung Tack (盧承卓), Professor Emeritus

Department of Mechanical and Aerospace Engineering, Seoul National University

Phone & Fax: +82-2-880-1916, +82-2-883-1513

E-mail: stro@snu.ac.kr

LEE, Joon Sik (李俊植) Professor

Department of Mechanical and Aerospace Engineering, Seoul National University

Phone & Fax: +82-2-880-7117, +82-2-883-1513

E-mail: jslee123@snu.ac.kr

KIM, Min Soo (金民洙), Professor

Department of Mechanical and Aerospace Engineering, Seoul National University

Phone & Fax: +82-2-880-8362, +82-2-883-1513

E-mail: minskim@snu.ac.kr

CHA, Suk Won (車碩源), Professor

Department of Mechanical and Aerospace Engineering, Seoul National University

Phone & Fax: +82-2-880-1700, +82-2-883-1513

E-mail: swcha@snu.ac.kr

KO, Seung Hwan (高承煥), Professor

Department of Mechanical and Aerospace Engineering, Seoul National University

Phone & Fax: +82-2-880-7114, +82-2-880-8302

E-mail: maxko@snu.ac.kr

DO, Hyungrok (都炯錄), Associate Professor

Department of Mechanical and Aerospace Engineering, Seoul National University

Phone & Fax: +82-2-880-1597, +82-2-883-1513

E-mail: hyungrok@snu.ac.kr

SONG, Han Ho (宋漢虎), Associate Professor

Department of Mechanical and Aerospace Engineering, Seoul National University

Phone & Fax: +82-2-880-1651, +82-2-880-1651

E-mail: hhsong@snu.ac.kr

HWANG, Wontae (黃元泰), Assistant Professor

Department of Mechanical and Aerospace Engineering, Seoul National University

Phone & Fax: +82-2-880-1723, +82-2-883-1513

E-mail: wthwang@snu.ac.kr

PARK, Hyungmin (朴炯旻), Associate Professor

Department of Mechanical & Aerospace Engineering

Phone & Fax: +82-2-880-9158, +82-2-883-1513

E-mail: hminpark@snu.ac.kr

List of Participants from Kyoto University

Kyoto 606-8501, Japan

HU, Yong (胡 勇), Postdoc

Department of Mechanical Engineering and Science

Phone: +81-75-383-3657

E-mail: hu.yong.8m@kyoto-u.ac.jp

ITO, Kei (伊藤 啓), Associate Professor

Research Reactor Institute

Phone: +81-72-451-2382

E-mail: k-ito@rri.kyoto-u.ac.jp

IWAI, Hiroshi (岩井 裕), Associate Professor

Department of Aeronautics and Astronautics

Phone & Fax: +81-75-383-3651, +81-75-383-3652

E-mail: iwai.hiroshi.4x@kyoto-u.ac.jp

KAWAGUCHI, Tomohisa (川口 智央), Graduate student

Department of Aeronautics and Astronautics

Phone & Fax: +81-75-383-3652

E-mail: kawatomo.0121@gmail.com

KISHIMOTO, Masashi (岸本 将史), Assistant Professor

Department of Aeronautics and Astronautics

Phone & Fax: +81-75-383-3652

E-mail: kishimoto.masashi.3m@kyoto-u.ac.jp

KURIYAMA, Reiko (栗山 怜子), Assistant Professor

Department of Mechanical Engineering and Science

Phone & Fax: +81-75-383-3608

E-mail: kuriyama@me.kyoto-u.ac.jp

KUROSE, Ryoichi (黒瀬 良一), Professor

Department of Mechanical Engineering and Science

Phone: +81-75-383-3654

E-mail: kurose@mech.kyoto-u.ac.jp

SAITO, Motohiro (齋藤 元浩), Assistant Professor

Department of Aeronautics and Astronautics

Phone & Fax: +81-75-383-3652

E-mail: msaito@mech.kyoto-u.ac.jp

SAITO, Yasushi (齋藤 泰司), Professor,

Research Reactor Institute

Phone: +81-72-451-2374

E-mail: ysaito@rri.kyoto-u.ac.jp

TATSUMI, Kazuya (巽 和也), Associate Professor

Department of Mechanical Engineering and Science

Phone & Fax: +81-75-383-3606, +81-75-383-3608

E-mail: tatsumi@me.kyoto-u.ac.jp

YOKOMINE, Takehiko (横峯 健彦), Professor

Department of Nuclear Engineering

Phone: +81-75-383-3922

E-mail: yokomine@nucleng.kyoto-u.ac.jp

YOSHIDA, Hideo (吉田 英生), Professor

Department of Aeronautics and Astronautics

Phone & Fax: +81-75-383-3650

E-mail: sakura@hideoyoshida.com

List of Participants from Tsinghua University

Beijing 100084, China

Bingyang CAO (曹炳阳), Professor

School of Aerospace Engineering, Tsinghua University

Phone +86-010-6279-7038, Fax +86-10-6278-7038

E-mail: caoby@tsinghua.edu.cn

Qun CHEN (陈群), Professor

Dept of Engineering Mechanics, Tsinghua University

Phone +86-10-6279-6332, Fax +86-10-6279-6332

E-mail: chenqun@tsinghua.edu.cn

Chen ZHIQIANG (陈志强), PhD student

Department of Engineering Mechanics and CNMM, Tsinghua University

Phone: 186-4744-8500; Fax: +86-10-627-87498

E-mail: 1452087789@qq.com

Wuhuan GAO (高武焕), PhD student

School of Aerospace Engineering, Tsinghua University

Phone: 15201521804; Fax: +86-10-62788702

E-mail: gaowh2015@163.com

Xingang LIANG (梁新刚), Professor

School of Aerospace Engineering, Tsinghua University

Phone & Fax: +86-10-62788702

E-mail: liangxg@tsinghua.edu.cn

Liaofei YIN (银了飞), Postdoctor

Department of Thermal Engineering, Tsinghua University

Phone & Fax : +86-10-62771415

Email: yliaofei@mail.tsinghua.edu.cn

Yuewu WANG (王岳武), Postdoctor

Department of Thermal Engineering, Tsinghua University

Phone: +86-13810359960

E-mail: wangyuewu@tsinghua.edu.cn

Zhiyuan WEI (魏志远), PhD student

Department of Building Science, Tsinghua University

Phone: +86-10-6277-2518; Fax: +86-10-62773461

E-mail: 784692842@qq.com



Contents

*: Presenter

Session 1 / Thermal Engineering I

Modeling and Analysis of Thermoplastic Composites Manufacturing Processes Reinforced with Continuous Fiber.....	1
Woo Il Lee*	
Thermal Smart Materials with Tunable Thermal Conductivity.....	2
Bing-Yang Cao *, De-Shan Qiao, Ruo-Yu Dong	
The Influence of Transport Processes on Combustion in a Channel with Porous Catalytic Wall	3
Motohiro Saito*, Atsushi Ueyama, Syogo Sakurai, Hiroshi Iwai, Hideo Yoshida	
Isn't It Strange That The Material Derivative D/Dt Has No Mass in Its Definition?.....	4
Charn-Jung Kim*	

Session 2 / Fluid Engineering I

Wall –induced Three-dimensional Flow Structures in the Wake of a Rising Bubble.....	4
Hyungmin Park*, Joohyoung Lee	
Visualization of Flow Boiling in a Large Aspect Ratio Microchannel.....	5
Liaofei Yin*, Peixue Jiang, Ruina Xu	
Enhanced Interface-tracking Method and its Application to Thermal-hydraulic Phenomena.....	6
Kei Ito*, Daisuke Ito, Yasushi Saito	

Session 3 / Thermal Engineering II

A New Method of Optimizing Heat Exchanger Network by Considering Variation of Mass Flow Rate	7
Zhiyuan Wei*, Yinping Zhang	
High-temperature Multiple-impinging Jet Heat Transfer.....	8
Takehiko Yokomine*, Tomoaki Kunugi	
Thermal Cracking Process and Mechanism by Thermo-Mechanical Coupled DEM Modeling	9
Chen Zhiqiang*, Moran Wang	

Session 4 / Fluid Engineering II

Flow Boiling in an Open-cell Metal Foam Mini-Channel Evaporator.....	10
Wuhuan Gao*, Xianghua Xu, Xingang Liang	
Particle Convection and Alignment in Microchannel Flows using Dielectrophoretic Force with	

Ladder-type Electrodes 11
Kazuya Tatsumi*, Takehiko Esaka, Atsushi Noma, Reiko Kuriyama, Kazuyoshi Nakabe

Investigation of Flow in a Triangular Channel with a Sharp Corner Using Magnetic Resonance Velocimetry.. 12
Seungchan Baek, Wontae Hwang *

Session 5 / Energy System

Dual fuel PCI in Diesel Engines 13
Sanghyun Chu, Jaegu Kang, Kyoungdoug Min*

Experimental Investigation on Reforming Reaction of Methane-ammonia Mixed Fuel on Ni-YSZ Catalyst.... 14
Tomohisa Kawaguchi*, Masashi Kishimoto, Motohiro Saito, Hiroshi Iwai, Hideo Yoshida

Dispatch of Combined Heat and Power Plants with Heat Storage Facilities for Wind Power Accommodation. 15
Huan Ma, Qun Chen*, Kang Hu

Three Dimensional Assembly of Nanoparticles and Its Applications to Sensors and Solar Cells..... 16
Mansoo Choi*

Session 6 / Thermal Engineering III

A Multi-regime Flamelet Modeling of Partially Premixed Spray Combustion..... 17
Yong Hu*, Ryoichi Kurose

Measurement of the Modal Parameters for a Plate-structure under 1200 °C High Temperature Environment... 18
Yuewu Wang*, Tairan Fu

Well-to-Wheel Analysis (WTW) on Greenhouse Gas Emissions of Transportation Fuels in Korea..... 19
Won Jae Choi, Eunji Yoo, Jae Jun Jang, Eunsu Seol, Myungsoo Kim, Han Ho Song*

Special Session / Three Asian University Conference

Two Decades of Korea/Seoul, China/Tsinghua and Japan/Kyoto Cooperation..... 20
Hideo Yoshida*