

OS1: Nano-mega Scale Flow Dynamics in Energy Systems

SAKURA 2

September 26, 2007

- OS1-1
9:00-9:20 **Numerical Study of Ignition Induced Oscillation on Propagation of Premixed Flame**
Akter Hossain (The University of Tokyo, Japan), Takuji Nakashima (Hiroshima University, Japan), Nobuyuki Oshima, Yuji Nakamura (Hokkaido University, Japan), Marie Oshima (The University of Tokyo, Japan)
- OS1-2
9:20-9:40 **Imaging on Lean Turbulent Flames with Local Extinction by Acetone-OH Simultaneous PLIF**
Yuji Nakamura (Hokkaido University, Japan), Satoshi Manome (Tohogas, Co. Ltd., Japan), Hiroshi Yamashita (Nagoya University, Japan)
- OS1-3
9:40-10:00 **Development of Effective Plasma Jet Torch Under High Pressure**
K. Takita (Tohoku University, Japan), M. Hirota (Muroran Institute of Technology, Japan), Q. Xiao, Y. Ju (Princeton University, U.S.A.)
- OS1-4
10:00-10:20 **Study of an Innovative Hybrid Pneumatic Power System**
K. David Huang (National Taipei University of Technology, Taiwan), Khong Vu Quang, Shih-Hung Wei (Da-Yeh University, Taiwan), Ting-Chi Liu (National Taipei University of Technology, Taiwan), Kuo-Tung Tseng (Industrial Technology Research Institute, Taiwan), Yao-Wen Tsai (Da-Yeh University, Taiwan)
- OS1-5
10:20-10:40 **Effect of Mean Droplet Size of Liquid Fuel Spray on Soot Formation**
Fumiteru Akamatsu, Jun Hayashi, Takehiko Seo, Chulju Ahn (Osaka University, Japan)
- Invited lecture**
OS1-6
15:30-16:10 **Factors Governing Oxygen Reduction in Mixed Conducting Solid Oxide Fuel Cell Cathodes**
S. B. Adler, J. R. Wilson, C. Kreller, Y. X. Lu, D. Baskar (University of Washington, U.S.A.)
- OS1-7
16:10-16:30 **Experimental Determination of Oxygen Flow Pathway in the Microstructure of Solid Oxide Fuel Cell Electrodes**
Tatsuya Kawada, Atsushi Unemoto, Koji Amezawa, Keiji Yashiro, Takashi Nakamura, Maya Sase, Masakazu Kudo, Atsushi Kaimai, Kazuhisa Sato, Junichiro Mizusaki (Tohoku University, Japan), Teruhisa Horita, Natsuko Sakai, Katsuhiko Yamaji, Harumi Yokokawa (National Institute of Advanced Industrial Science and Technology, Japan)
- OS1-8
16:30-16:50 **Electrode Reaction at the Interface of $(La_{0.6}Sr_{0.4})(Mn_{1-x}M_x)O_3$ (M=Fe, Co and Ni)/ $(Ba_{0.3}Sr_{0.2}La_{0.5})InO_{2.75}$ Electrolyte**
Katsuyoshi Kakinuma, Hiroshi Yamamura (Kanagawa University, Japan), Tooru Atake (Tokyo Institute of Technology, Japan)
- 16:50-17:10 Break

- OS1-9
17:10-17:30 **Analysis and Verification of MEA Degradation Mechanism in PEMFC through SEM images and DGMS**
Jae Young Shim (Tokyo Institute of Technology, Japan), Jeffrey T. Gostick (University of Waterloo, Canada), Shohji Tsushima, Shuichiro Hirai (Tokyo Institute of Technology, Japan)
- OS1-10
17:30-17:50 **Power Generation of Electricity by a new Ni/GDC/BCY Anode-Type SOFC combined with Biomass Gasification**
Katsunori Hanamura (Tokyo Institute of Technology, Japan)
- OS1-11
17:50-18:10 **Autothermal Reforming of Methanol Using Hydrogen Peroxide for Portable Fuel Cells**
Eun Sang Jung, Taegy Kim, Sejin Kwon (Korea Advanced Institute of Science and Technology, Korea)
- OS1-12
18:10-18:30 **Investigation on SOFC Cathodic Reaction by In Situ X-Ray Absorption Spectroscopy**
Koji Amezawa, Atsushi Unemoto, Tatsuya Kawada, Maya Sase, Atsushi Kaimai, Kazuhisa Sato, Keiji Yashiro, Junichiro Mizusaki (Tohoku University, Japan), Muneaki Rai, Yuki Orikasa, Yoshiharu Uchimoto (Kyoto University, Japan)

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- OS1-13
9:00-9:20 **On the Transition from a Circular Flame to a Traveling Flame in a Radial Microchannel**
Aiwu Fan (Tohoku University, Japan), Sergey Minaev (Institute of Theoretical and Applied Mechanics SB RAS, Russia), Sudarshan Kumar (Indian Institute of Technology Bombay, India), Wei Liu (Huazhong University of Science and Technology, China), Kaoru Maruta (Tohoku University, Japan)
- OS1-14
9:20-9:40 **Small Scale Catalytic Combustion Burning DME -Low Temperature Startability and Stable Operation Condition-**
O. Fujita, N. Hattori, K. Tameda (Hokkaido University, Japan)
- OS1-15
9:40-10:00 **Flame Synthesis of Upconversion Nanophosphors with Vapor Precursors**
Takeshi Yokomori (Keio University, Japan), Xiao Qin (Princeton University, U.S.A.), Toshihisa Ueda (Keio University, Japan), Masahiko Mizomoto (Keio University, Japan), Yiguang Ju (Princeton University, U.S.A.)
- OS1-16
10:00-10:20 **Non-intrusive UV Raman Scattering Measurements and Numerical Studies of Microscale Hydrogen Diffusion Flames**
C. Y. Wu (National Cheng Kung University, Taiwan), T. S. Cheng (Chung Hua University, Taiwan), Y. C. Chao, C. P. Chen (National Cheng Kung University, Taiwan)
- 10:20-10:40 Break

- OS1-17 **10N Class Thruster Utilizing Hydrogen Peroxide Decomposition**
 10:40-11:00 Jeongsub Lee, Sungyong An, Sejin Kwon (Korea Advanced Institute of Science and Technology, Korea)
- OS1-18 **Extinction Phenomena of Premixed and Non-premixed Combined Flames in an Opposite Turbulent Flow**
 11:00-11:20 Y. Yahagi, T. Yokoyama, H. Nakaza, T. Tsunekawa (Shibaura Institute of Technology, Japan)
- Invited lecture** **Chaotic Dynamics in Reactive Flow Systems**
 OS1-19 Toshihisa Ueda (Keio University, Japan)
 11:20-12:00
- 12:00-13:00 Lunch break
- Invited lecture** **Recent Developments in Micropower Generation Using Hydrocarbon Fuels**
 OS1-20 Paul D. Ronney (University of Southern California, U.S.A.)
 13:00-13:40
- OS1-21 **Experimental and Numerical Studies on a Small Clean Thermoelectric Power Generator**
 13:40-14:00 J. M. Chen, C. C. Liu, S. S. Shy (National Central University, Taiwan)
- OS1-22 **Comparison of Metallic Microchannel and Packed-bed Reactors for Autothermal Reforming of N-butane**
 14:00-14:20 Gyujong Bae, Joongmyeon Bae (Korea Advanced Institute of Science and Technology, Korea)
- OS1-23 **Micro PEM Fuel Cell Powered UAV with Sodium Borohydride as the Fuel Source**
 14:20-14:40 Taegy Kim, Hyunchul Shim, Sejin Kwon (Korea Advanced Institute of Science and Technology, Korea)
- OS1-24 **Efficiency of a Small-Size Thermoelectric Channel**
 14:40-15:00 Sergey Minaev, Roman Fursenko (Institute of Theoretical and Applied Mechanics SB RAS, Russia)
- Special lecture** **A Pioneer Program to Develop Human Resources for Interdisciplinary Green Technology by Taiwan's Ministry of Education**
 OS1-25 Shenqyang (Steven) Shy (National Central University, Taiwan)
 16:40-17:20
- OS1-26 **Flow Measurements and Simulations in Planar Solid Oxide Fuel Cell**
 17:20-17:40 C.M. Huang, S. S. Shy (National Central University, Taiwan), C.H. Lee (Institute of Nuclear Energy Research, Taiwan)

- OS1-27
17:40-18:00
Mixed Proton-Electron-Conducting Membrane for Hydrogen Separation
H. Matsumoto (Kyushu University, Japan), T. Shimura (Nagoya University, Japan), T. Higuchi (Tokyo University of Science, Japan), T. Otake, Y. Sasaki, K. Yashiro, T. Kawada, J. Mizusaki (Tohoku University, Japan), T. Ishihara (Kyushu University, Japan)
- OS1-28
18:00-18:20
Experimental Study on Gas Filtration Combustion Inclination Instability in Fibrous Porous Media
Hao Lin Yang, Seung Gon Kim, Kaoru Maruta (Tohoku University, Japan)
- OS1-29
18:20-18:40
A New Approach to Energy Conservation Rooftop Garden
Ho Yu-Feng (Chaoyang University of Technology, Taiwan), Wang Hsiao-Lin (Tunghai University, Taiwan)
- Invited lecture**
OS1-30
18:40-19:00
Gold Supported Catalysts for Preferential Oxidation of Carbon Monoxide in Hydrogen Stream
Yu-Wen Chen (National Central University, Taiwan)

OS2: Nano-mega Scale Dynamics in Highly Coupled Systems

ROOM 4

September 26, 2007

15:30-15:35 **Opening Address**
T. Ohara (Tohoku University, Japan)

KEYNOTE 1

OS2-KN1
15:35-16:35 **Local Analysis of Highly Coupled Fluid Flows by In Situ Optical Techniques: Case of Thin Elastohydrodynamic Lubricated Films**
P. Vergne (INSA-Lyon, CNRS, France)

KEYNOTE 2

OS2-KN2
16:45-17:45 **The Friction Behavior of DLC Films Deposited by Plasma CVD in Water and Air Environments**
T. Ohana (National Institute of Advanced Industrial Science and Technology, AIST, Japan)

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KEYNOTE 3

OS2-KN3
09:00-10:00 **Multi-level Combinatorial Computational Chemistry for Nano-Scale Flow Dynamics in Highly Coupled Systems**
A. Miyamoto (Tohoku University, Japan), A. Suzuki, R. Sahnoun, M. Koyama, H. Tsuboi, N. Hatakeyama, A. Endou, H. Takaba, M. Kubo and C. A. Del Carpio

GENERAL PRESENTATION

10:15-11:00 **Poster Preview at ROOM 4**
(3 min oral presentation + 1 min PC preparation for each paper)

11:00-12:00 **Poster Presentations at SAKURA 1**

OS2-G1 **Quantitative Evaluation of Diamond Film Adhesion Deposited on Mo Substrate Polished with Different Methods**
H. Wako (Tohoku University, Japan), T. Abe and T. Takagi

OS2-G2 **A Rarefied Gas Dynamics Study of Tribological Properties on Diamond Coated Surface**
M. Yamaguchi (Tohoku University, Japan), S. Yonemura, T. Takeno, H. Miki and T. Takagi

OS2-G3 **Energy and Momentum Transfer Characteristics in a Liquid Lubrication Ultra-Thin Water Film and at Solid-Liquid Interfaces**
D. Torii (Tohoku University, Japan) and T. Ohara

OS2-G4 **Effect of the Motion of Molecules on the Dissociative Adsorption Phenomena**
T. Tokumasu (Tohoku University, Japan) and D. Ito

OS2-G5 **Frequency Response Analysis and Active Control of Slot Coating**
T. Tsuda (Dai Nippon Printing Co., Ltd., Japan), Juan M. de Santos and L. E. Scriven (University of Minnesota, USA)

- OS2-G6 **Optical Measurement and Application to Water Purification of Micro Bubbles Generated Using SPG Membrane**
D. Sakihama (Tohoku University, Japan), S. Yoshioka, T. Kato, Y. Kohama and S. Takeda (Flowtech Research Inc., Japan)
- OS2-G7 **Microscopic Structure of Liquid-Vapor Interface in Water and L-J Fluid Studied by Molecular Dynamics Simulations**
G. Kikugawa (Tohoku University, Japan), S. Takagi (The University of Tokyo, Japan), Y. Matsumoto, and T. Ohara (Tohoku University, Japan)
- OS2-G8 **Numerical Investigation on Bimetallic Ag-Au SPR Biosensor with Wavelength Modulation**
H. R. Gwon (Chung-Ang University, Korea) and S. H. Lee
- OS2-G9 **Molecular Dynamics Study on Thermal Energy Transfer in Lipid Bilayer Membranes**
T. Nakano (Tohoku University, Japan), G. Kikugawa and T. Ohara
- OS2-G10 **Particle-in-Cell/Monte Carlo Simulation of DC Magnetron Discharges**
T. Iwao (Tohoku University, Japan) and S. Yonemura

OS3: Nano-mega Scale Flow Dynamic for Advanced Aerospace Technology

ROOM 6

September 26, 2007

OS-3 Opening Address

K. Nakahashi (Tohoku University, Japan)

OS3-1: CFD for Aerospace (Session Chair : K. Matsushima (Tohoku Univ.))

OS3-1-1 **CFD Validation about High-Lift Configuration of Civil Transport Aircraft**
9:05-9:25
R. Nakayama, K. Matsushima and K. Nakahashi (Tohoku University, Japan)

OS3-1-2 **Characteristics of Weighted Compact Nonlinear Scheme for Implicit LES**
9:25-9:45
K. Ishiko, N. Ohnishi, K. Ueno and K. Sawada (Tohoku University, Japan)

9:45-10:00 (Break)

OS3-1-3 **Incompressible Flow Analysis by Building-Cube Method**
10:00-10:20
S. Takahashi, T. Ishida and K. Nakahashi (Tohoku University, Japan)

OS3-1-4 **Quick and Reliable Cartesian Mesh Generation for Building-Cube Method**
10:20-10:40
T. Ishida and K. Nakahashi (Tohoku University, Japan)

OS3-2: Plasma Enhanced Aerodynamics (Session Chair : K. Asai (Tohoku Univ.))

OS3-2-1 **DBD Plasma Actuator and Electrodynamic Heat Shield— Possible Flow Control Techniques by an Electro-Magnetic Means**
15:30-16:10
(Invited) T. Abe (ISAS /JAXA, Japan)

OS3-2-2 **Gaseous Effects on Plasma Formation and Force Production of a Single DBD Plasma Actuator**
16:10-16:30
J. W. Gregory, C. L. Enloe and T. E. McLaughlin (U.S. Air Force Academy, U.S.A.)

OS3-2-3 **Investigation of the Plasma Actuator Performance on the Martian Atmosphere**
16:30-16:50
S. Isono, M. Takagaki, H. Nagai and K. Asai (Tohoku University, Japan)

16:50-17:05 Break

- OS3-2-4 **Development of a Separation Control System Using
Pulse-Width-Modulated Plasma Actuators**
17:05-17:25 T. Matsuno, H. Kawazoe (Tottori University, Japan) and R. C. Nelson
(University of Notre Dame, U.S.A.)
- OS3-2-5 **Investigation on Wall-Shear Stress of Plane Turbulent Shear Layer
with Plasma Actuator**
17:25-17:45 T. Higuchi, K. Ogawara and M. Ohishi (Yamaguchi University, Japan)
- OS3-2-6 **Active Flow Control Around Wings Using PSJA**
17:45-18:05 M. Ohishi, K. Ogawara and T. Higuchi (Yamaguchi University, Japan)
- OS3-2-7 **An Experimental and Numerical Study on Interaction of
Laser-Induced Plasma with Shock Wave over a Blunt Body**
18:05-18:25 T. Sakai, Y. Sekiya, K. Mori and A. Sasoh (Nagoya University, Japan)

OS3-3: High Speed Aircrafts (Session Chair : K.Yoshida (JAXA))
September 27, 2007

- OS3-3-1 **Fundamentals of Supersonic Wave Drag**
9:00-9:40 B. Kulfan (Boeing Commercial Airplane Group, U.S.A.)
(Invited)
- OS3-3-2 **“ CST” Universal Parametric Geometry Method With Applications to
Supersonic Aircraft**
9:40-10:20 B. Kulfan (Boeing Commercial Airplane Group, U.S.A.)
(Invited)
- 10:20-10:35 Break

OS3-3: High Speed Aircrafts (Session Chair : N. Kuratani (Tohoku Univ.))

- OS3-3-3 **JAXA Supersonic Experimental Airplane Project – NEXST-1 Flight
Test –**
10:35-10:55 K. Yoshida (Aviation Program Group, JAXA, Japan)
- OS3-3-4 **Validation of CFD Capability for Supersonic Transport Analysis
Using NEXST-1 Flight Test Data**
10:55-11:15 M. Umeda, K. Takenaka, K. Hatanaka, D. Hirayama, W. Yamazaki, K.
Matsushima and K. Nakahashi (Tohoku University, Japan)
- OS3-3-5 **The Application of PARSEC Geometry Representation to
High-Fidelity Supersonic Wing Design**
11:15-11:35 T. Matsuzawa, K. Matsushima and K. Nakahashi (Tohoku University, Japan)
- OS3-3-6 **Wing Shape Optimization of a Near-Sonic Passenger Plane**
11:35-11:55 T. Watanabe, W. Yamazaki, K. Matsushima and K. Nakahashi (Tohoku University,
Japan)

OS3-6: Innovative Aircraft (Session Chair : H. Higuchi (Syracuse Univ.))

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- OS3-6-1 **Current Developments in Aeromechanics Relevant to an
9:00-9:40 **Insect-Inspired Flapping-Wing Micro Air Vehicle**
(Invited) K. Knowles, P. C. Wilkins, S. A. Ansari and R. Zbikowski (Cranfield
University, U.K.)**
- OS3-6-2 **Development of a Resonance Type Flapping Wing for Micro Air
9:40-10:20 **Vehicles**
(Invited) K. Isogai, H. Sato and Y. Kamisawa (Nippon Bunri University, Japan)**
- 10:20-10:35 Break
- OS3-6-3 **Experimental Study of Oscillating SD8020 Foil for Propulsion
10:35-10:55 **S. Srigrarom**, H. T. Tan and W. S. Chai (Nanyang Technological University,
Singapore)**
- OS3-6-4 **Experimental Investigation of Perturbations on Vortex Breakdown
10:55-11:15 **Over Delta Wings**
 S. Srigrarom and M. Ridzwan (Nanyang Technological University, Singapore)**
- OS3-6-5 **UAV Concept with Combined Distributed Propulsion and
11:15-11:55 **Circulation Control via the Cross Flow Fan**
(Invited) T. Dang, J. Kummer and R. Dygert (Syracuse University, U.S.A.)**

OS4: Nano-mega Scale Flow Dynamics in Complex Systems

ROOM 7

September 26, 2007

9:00- 9:05 **OS-4 Opening Address**
H. Nishiyama (Tohoku University, Japan)

[Electromagneto Rheological Fluids]

Chair: Prof. M. Nakano and Prof. H. Yamaguchi

OS4-KN1 **Dynamics of Electrorheological Fluids (*Invited*)**
9:05- 9:45 P. Sheng (Hong Kong University of Science & Technology, Hong Kong)

OS4-1 **ER Properties and Dynamic Flow Behavior of Nano-Particle Electro-Rheological Fluid between Two Rotating Parallel Disks**
9:45-10:05 M. Nakano, M. Kobayashi (Yamagata University, Japan) and K. Tanaka (Kyoto Institute of Technology, Japan)

OS4-2 **Evaluation of Sealing Characteristics in MR Fluid Channel Flow Relating to Magneto-Rheological Properties**
10:05-10:25 H. Nishiyama, H. Takana, K. Mizuki, T. Nakajima and K. Katagiri (Tohoku University, Japan)

OS4-3 **Heat Dissipation in Magnetite Particles Dispersed Hydro-gel Exposed to AC Magnetic Field**
10:25-10:45 M. Suto, K. Maruta, M. Ohta, H. Kosukegawa, R. J. Joseyphus, K. Tohji and B. Jeyadevan (Tohoku University, Japan)

[Magnetic Fluids] Chair: Prof. S. Sudo and Prof. T. Sawada

OS4-4 **Numerical Simulation of Structure Formation of Magnetic Particles and Nonmagnetic Particles in MAGIC Fluids under Steady Magnetic Field**
15:30-15:50 Y. Ido and T. Inagaki (Nagoya Institute of Technology, Japan)

OS4-5 **Non-contact Investigation of Chain-like Cluster Formation in a Magnetic Fluid by Ultrasonic Technique**
15:50-16:10 M. Motozawa, H. Takuma and T. Sawada (Keio University, Japan)

OS4-6 **A Study on the Response of Magnetic Fluid Pendulum to an Alternating Magnetic Field**
16:10-16:30 S. Sudo, Y. Kurosu, T. Yano (Akita Prefectural University, Japan) and M. I. Shliomis (Ben-Gurion University, Israel)

OS4-7 **Interfacial Phenomena of Magnetic Fluid with Permanent Magnet in a Longitudinally Excited Container**
16:30-16:50 S. Sudo, H. Wakuda and T. Yano (Akita Prefectural University, Japan)

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[Complex Plasma Flow 1] Chair: Prof. J. J. Lowke and Prof. T. Inaba

OS4-KN2 **Flow Dynamics in Arc Welding (*Invited*)**
9:30-10:10 J. J. Lowke (CSIRO Industrial Physics, Australia) and M. Tanaka (Osaka University, Japan)

- OS4-KN3
10:10-10:50 **Numerical Modeling of Electric Arcs with Water Vortex and Hybrid Stabilizations (*Invited*)**
J. Jeništa (Institute of Plasma Physics, ASCR, Czech), M. Bartlova and V. Aubrecht (Brno University of Technology, Czech)
- OS4-8
10:50-11:10 **Proposal of Modified Stagnation Coefficient of Plasma Arc Mode**
B. Liu and T. Inaba (Chuo University, Japan)
- OS4-9
11:10-11:30 **Current Attachment at Thermionic Cathode for Gas Tungsten Arcs**
M. Tanaka, K. Yamamoto, S. Tashiro (Osaka University, Japan) and J. J. Lowke (CSIRO Industrial Physics, Australia)
- 11:30-13:00 Lunch
- [Complex Plasma Flow 2]** Chair: Prof. H. Nishiyama and Prof. O. P. Solonenko
- OS4-KN4
13:00-13:40 **Spreading and Solidification of Hollow Molten Droplet under its Impact onto Substrate: Computer Simulation and Experiment (*Invited*)**
O. P. Solonenko, A. N. Cherepanov, A. V. Smirnov, I. P. Gulyaev, V. V. Bublik and E. V. Kartsev (Branch of Russian Academy of Sciences, Russia)
- OS4-KN5
13:40-14:20 **Mathematical Modelling of Advanced Thermal Plasma Reactors and Application to Nanoparticle Production (*Invited*)**
P. Proulx and M. E. Morsli (Universite de Sherbrooke, Canada)
- OS4-10
14:20-14:40 **TiO₂ Film Deposition by Atmospheric Thermal Plasma CVD Using Laminar and Turbulence Plasma Jets**
Y. Ando, S. Tobe (Ashikaga Institute of Technology, Japan) and H. Tahara (Osaka Institute of Technology, Japan)
- OS4-11
14:40-15:00 **Non-equilibrium Plasma MHD Electrical Power Generation at Tokyo Tech**
T. Murakami, Y. Okuno and H. Yamasaki (Tokyo Institute of Technology, Japan)
- [Complex Plasma Flow 3]** Chair: Prof. T. Sato and Prof. H.-P. Li
- OS4-KN6
16:40-17:20 **Fluid Complex Plasmas – Studies at the Particle Level (*Invited*)**
A. Ivlev and G. Morfill (Max Planck Institute for Extraterrestrial Physics, Germany)
- OS4-KN7
17:20-18:00 **Radio-Frequency, Atmospheric-Pressure Glow Discharges: Producing Methods, Characteristics and Applications in Bio- Medical Fields (*Invited*)**
H.-P. Li, G. Li, W.-T. Sun, S. Wang, C.-Y. Bao, L. Wang, Z. Huang, N. Ding, H. Zhao and X.-H. Xing (Tsinghua University, China)
- OS4-12
18:00-18:20 **NO_x Reduction Performance Test for Boiler Emission Using the Second Prototype Commercial-Scale Plasma-Chemical Hybrid System**
T. Kuroki (Osaka Prefecture University, Japan), H. Fujishima (Japan Science and Technology Agency, Japan), K. Otsuka (Takao Iron Works Co., Ltd., Japan), T. Ito, M. Okubo (Osaka Prefecture University, Japan), T. Yamamoto (Musashi Institute of Technology, Japan) and K. Yoshida (Japan Science and Technology Agency, Japan)

OS4-13 **Reactive Air Jet Generated by Dielectric Barrier Discharge for Ignition Assist**
18:20-18:40 H. Nishiyama, H. Takana, H. Shimizu, S. Niikura, K. Katagiri and Y. Nakano (Tohoku University, Japan)

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[Complex Structured Fluids 1] Chair: Prof. T. Sato and Dr. H. Takana

OS4-14 **Can Microscale Wall Roughness Trigger Unsteady/Chaotic Flows?**
9:00-9:20 F. Varnik and D. Raabe (Max-Planck-Institut für Eisenforschung, Germany)

OS4-15 **Drop Impacts on a Solid Surface Comprising Micro Groove Structure**
9:20-9:40 R. Kannan and D. Sivakumar (Indian Institute of Science, India)

OS4-16 **Surface Tension Effect to Die-Swell Extrusion of Viscoelastic Fluid**
9:40-10:00 S. Bunditsaovapak, T. Fagon (King Mongkut's Institute of Technology Ladkrabang, Thailand) and S. Thenissara (Rajamagala University of Technology Isan Nakornratchasima, Thailand)

OS4-17 **Linear Analysis for a Finite Liquid Jet**
10:00-10:20 C.-C. Chao and C.-Y. Lin (Chien-Kuo Technology University, Taiwan)

10:20-10:40 Break

[Complex Structured Fluids 2] Chair: Prof. H. Nishiyama and Prof. K. Iwai

OS4-18 **Averaged Passing Time of Single Bubble Rising in Sodium Chloride Solution under Horizontal DC High Magnetic Field**
10:40-11:00 K. Iwai and I. Furuhashi (Nagoya University, Japan)

OS4-19 **Pulsed Ultrasound Microbubble Contrast Agents Interaction Simulations**
11:00-11:20 S. W. Fong, E. Klaseboer (Institute of High Performance Computing, Singapore) and B. C. Khoo (National University of Singapore, Singapore)

OS4-20 **Study on the CO₂ Solid-gas Two Phase Flow with Particle Sublimation and its Basic Applications**
11:20-11:40 X.-R. Zhang, H. Yamaguchi and M. Masuda (Doshisha University, Japan)

11:40-11:45 **OS-4 Closing Address**
H. Nishiyama (Tohoku University, Japan)

OS5: International Workshop on Water Dynamics

HAGI

September 26, 2007

9:25 – 9:30 **Opening Address**
Kazuyuki Tohji
Graduate School of Environmental Studies,
Tohoku University, Japan

Session 1

OS5-1 9:30 – 10: 00
**Factors Affecting Biohydrogen Generation by
Rhodobactersphaeroides from Organic Wastewater (Invited)**
Q. Zhou, L. Wang, Z. H. Kang, Y. F. Qian
School of Environmental Science and Engineering,
Tongi University, Shanghai, 200092, China

OS5-2 10:00 – 10: 30
**Current Development in Treatment and Hydrogen Energy
Conversion of Organic Solid Waste (Invited)**
Hang-Sik Shin and Hyun-Woo Kim
Department of Civil and Environmental Engineering
KAIST, Daejeon, Korea

OS5-3 10:30 – 11: 00
**Hydrogen Production From Wastewater with NH₄⁺ Resistant Mutant of
Rhodobacter sphaeroides (Invited)**
L. Wang, Q. Zhou, Y. F. Qian, Z. H. Kang
School of Environmental Science and Engineering, Tongi University,
Shanghai, 200092, China

11:00 – 12:00 **Plenary Lecture 1**

12:00 - 13:00 **Lunch Break**

Session 2

13:00-14:10 **Poster Preview**

14:10 – 15:10 **Plenary Lecture 2**

15:10 - 15:30 **Tea Break**

Session 3

OS5-4 15:30 – 16: 00
**Structural Properties of Yttrium Trihydride Under High
Pressure**
A. Machida
Synchrotron Radiation Research Center, Japan Atomic Energy Agency

- OS5-5 16:00 – 16:30
Overview of Studies on Space Solar Power System (SSPS) and Photocatalytic Hydrogen Generation (Invited)
H. Suzuki, M. Nino, M. Mori and K. Tohji
Advanced Mission Research Center, Institute of Aerospace Technology, Japan Aerospace Exploration Agency, Tokyo, Japan
- OS5-6 16:30 – 17:00
Formation of Formic Acid by Hydrothermal Oxidation of Carbohydrate Biomass for Producing Hydrogen (Invited)
F. Jin, J. Yun, G. Li, A. Kishita, K. Tohji, and H. Enomoto
School of Environmental Science and Engineering, Tongji University, Shanghai, 200092, China
- OS5-7 17:00 – 17:30
Application of Hydrogen Isotope Geochemistry to Volcanology: Recent Perspective on Eruption Dynamics
M. Nakamura
Graduate School of Science, Tohoku University, Japan

HAGI

September 27, 2007

Session 4

- OS5-8 9:30 – 10: 00
Bisphenol A and Alkylphenol in Wastewater and Sludge in Beijing City, China (Invited)
G. Yu, G. Shen and J. Huang
Department of Environmental Science and Engineering, Tsinghua University, China
- OS5-9 10:00 – 10: 30
Efficient hydrogen production from water and environmental purification using semiconductor photoelectrodes and photocatalysts (Invited)
K. Sayama and T. Arai,
Solar Light Energy Conversion Group, Energy Technology Research Institute, National Institute of Advanced Industrial Science and Technology (AIST), Japan
- OS5-10 10:30 – 11: 00
Over All Water Splitting on Heterogeneous Photocatalysts (Invited)
K. Domen,
Department of Chemical System Engineering, School of Engineering, University of Tokyo, Japan

11:00 - 11:20 **Tea Break**

Session 5

- OS5-11 11:20 – 11: 50
Photoelectrochemical reactions and hydrogen evolution of III-nitride semiconductors (Invited)
Katushi Fujii, Takafumi Yao, Kazuhiro Ohkawa
Tohoku University International Advanced Research and Education Organization, Japan
- OS5-12 11:50 – 12: 20
Effective Hydrogen Generation from the Hydrogen Sulfide Solution by using Stratified Type Photocatalyst (Invited)
H. Takahashi, S. Yokoyama, Y. Baba, T. Hayashi, B. Jeyadevan, K. Tohji, Graduate School of Environmental Studies, Tohoku University
- OS5-13 12:20 – 12: 50
Hydrodynamic Behavior in a Biohydrogen Production Bioreactor by Pressure Fluctuation Analysis
C-Y. Chu, Y-C. Wu, S-Y. Wu, C-Y Lin, P-J. Lin, Alex C.-C. Chang, J-S. Chang, K-S. Lee
Feng Chia University, Taichung 407, Taiwan
- 12:50 – 12: 55 **Closing Remarks**
Kazuyuki Tohji
Graduate School of Environmental Studies,
Tohoku University

**OS7: The Third International Students / Young Birds Seminar
on Multi-scale Flow Dynamics**

TACHIBANA

September 26, 2007

9:00-9:04 **Opening Address**
H. Kobayashi (Tohoku University, Japan)

Session 1

9:04-9:40 **Short Oral Presentation**
(6 min for Short Oral Presentation including PC preparation)

9:40-9:50 Break

9:50-10:30 **Poster Presentation**

OS7-1 **Study on Dissociation Probability of H₂ on Pt(111) Surface**
D. Ito and T. Tokumasu (Tohoku University, Japan)

OS7-2 **Dimethyl-Ether (DME) Injection Strategy for Compression-Ignition Engine**
H. Yoon and C. S. Bae (KAIST, Korea)

OS7-3 **Evaluation of the Relation between Frozen Regions and Heat Transfer Coefficient of Cooling Needle**
J. Okajima, S. Maruyama and A. Komiya (Tohoku University, Japan)

OS7-4 **Evaluation of Lifetime-Based Pressure-Sensitive Paint Measurement in Low-Speed Flow**
T. Yamashita, H. Nagai and K. Asai (Tohoku University, Japan)

OS7-5 **Cooling and Heating by Adiabatic Magnetization in the Heusler Magnetic Shape Memory Alloys**
K.V. Klimov and A.N. Vasiliev (Moscow State University, Russia)

OS7-6 **Electrical Conductivity and Defect Concentration of BaCe_{0.9}M_{0.1}O_{3-δ} (M=Y, Yb, Tb, and Nd)**
M. Oishi, S. Akoshima, K. Yashiro, K. Sato, T. Kawada, and J. Mizusaki (Tohoku University, Japan)

Session 2

15:30-16:40 **Short Oral Presentation**
(6 min for Short Oral Presentation including PC preparation)

16:40-16:50 Break

16:50-18:10 **Poster Presentation**
(16:50-17:30 poster presentation for odd-numbered posters)
(17:30-18:10 poster presentation for even-numbered posters)

- OS7-7 **Effects of Water Vapor Dilution on Turbulent Premixed Flames at High Pressure and High Temperature**
S. Yata, H. Kobayashi and Y. Ogami (Tohoku University, Japan)
- OS7-8 **Near-Wall Aerodynamics of Idealized Foot Motion**
Y. Kubota, H. Higuchi (Syracuse University, U. S. A.)
- OS7-9 **Capturing Time-Dependent Behavior of Flows with More Than One Time Scale**
M. S. Saini and J. W. Naughton (University of Wyoming, U. S. A.)
- OS7-10 **A Study of Flow Field of Wall Injection Interacting with Incident Shock Wave Using PTV and Numerical Simulation**
S. Ishida (Tohoku University, Japan), N. Sato (IHI Co., Ltd., Japan), H. Nakamura, Y. Ogami and H. Kobayashi (Tohoku University, Japan)
- OS7-11 **Energy Harvesting Utilizing a Piezoelectric Element by the SSHI Technique**
F. Takahashi, A. Badel, J. Qiu, and T. Takagi (Tohoku University, Japan)
- OS7-12 **The Numerical Estimation of the Conductivity of Donor-Doped Strontium Titanate**
F. Horikiri, E. Niwa, K. Sato, K. Yashiro, T. Kawada and J. Mizusaki (Tohoku University, Japan)
- OS7-13 **Reduced Kinetic Mechanism of Ethanol for Multi-Dimensional Combustion Analysis**
M. Okuyama (Tohoku University, Japan), M. Kawase (Nippon Oil Corporation, Japan), Y. Ogami, H. Nakamura and H. Kobayashi (Tohoku University, Japan)
- OS7-14 **Numerical Study on Heat Transfer and Ablation Depth in Double-Layered Au/SiO₂ Films Irradiated by Femtosecond Pulse Laser Considering Interfacial Thermal Resistance**
H. S. Sim and S. H. Lee (Chung-Ang University, Korea)
- OS7-15 **Injectant Mole-Fraction Imaging in a Compressible Mixing Flow Using Acetone PLIF**
H. Takahashi, S. Ikegami, H. Oso, M. Hirota and G. Masuya (Tohoku University, Japan)
- OS7-16 **Comparison of Phase Function of Small Particles and Bubbles by Ray Tracing and Mie Theory**
M. Baneshi, S. Maruyama and A. Komiya (Tohoku University, Japan)
- OS7-17 **Experimental Analysis of Low Temperature Plasma Flow at Atmospheric Pressure**
S. Ochiai (Tohoku University, Japan), T. Urayama (Adtec Plasma Technology Co. Ltd., Japan) and T. Sato (Tohoku University, Japan)

TACHIBANA
September 27, 2007

Session 3

- 9:00-10:00 **Short Oral Presentation**
(6 min for Short Oral Presentation including PC preparation)
- 10:00-10:10 Break
- 10:10-11:30 **Poster Presentation**
(10:10-10:50 poster presentation for odd-numbered posters)
(10:50-11:30 poster presentation for even-numbered posters)
- OS7-18 **Enhancement of ^{18}O Surface Exchange on the Hetero Phase Interface of $(\text{La}, \text{Sr})\text{CoO}_3/(\text{La}, \text{Sr})_2\text{CoO}_4$**
M. Sase, F. Helmes, K. Yashiro, K. Sato, J. Mizusaki, T. Kawada (Tohoku University, Japan), N. Sakai, K. Yamaji, T. Horita and H. Yokokawa (National Institute of Advanced Industrial Science and Technology, Japan)
- OS7-19 **Effects of Air Dilution with N_2 , H_2O and CO_2 on Regression and Extinction of Polypropylene Combustion in Stagnation Point Flow**
K. Yoshinaga and H. Kobayashi (Tohoku University, Japan)
- OS7-20 **Numerical and Experimental Study on Non-Newtonian Flow with Pulsation in Bifurcated Blood Vessel**
K. C. Ro (Chung-Ang University, Korea), I. S. Lee (Home Appliance R&D of Samsung Electronic Corporation, Korea) and H. S. Ryou (Chung-Ang University, Korea)
- OS7-21 **Investigation of the Internal Flow in a Micro-Thruster Using PSP Measurement**
D. Kurashina, H. Nagai and K. Asai (Tohoku University, Japan)
- OS7-22 **Electrical Properties of Mixed-Conducting Oxide Film, $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$**
K. Iwamoto, K. Sato, K. Yashiro and J. Mizusaki (Tohoku University, Japan)
- OS7-23 **Computational Study of the Effect of Solid Radiation on Flame Behavior in Porous Media**
S. G. Kim (Tohoku University, Japan), T. Yokomori (Keio University, Japan), H. Yang and K. Maruta (Tohoku University, Japan)
- OS7-24 **On Speckle Technique Capability to Measure Heat Transfer Rate : Application to Free Convective Boundary Layer and Air Jet Impingement Problems**
C. Crespy, P. Gervais and D. Varietas (Université Lyon1, France)
- OS7-25 **Designing of the Mars Wind Tunnel to Simulate Low Reynolds Number and High Subsonic Flow in the Mars Atmosphere**
T. Sato, H. Nagai and K. Asai (Tohoku University, Japan)
- OS7-26 **Reaction Zone in a Mixed Conducting Oxide Anode for Solid Oxide Fuel Cell**
T. Nakamura, K. Yashiro, K. Sato, T. Kawada and J. Mizusaki (Tohoku University, Japan)
- OS7-27 **PIV Measurement on a Two-Phase Flow: The Formation of a Fiber**

Network

G. Bellani, F. Lundell and L. D. Söderberg (Royal Institute of Technology, Sweden)

Session 4

13:00-13:45

Short Oral Presentation

(6 min for Short Oral Presentation including PC preparation)

13:45-13:55

Break

13:55-14:35

Poster Presentation

OS7-28

Measurement of Heat Flux Emitted by Radiation Heater for Thermal Therapy

N. Ogasawara, S. Takashima, S. Maruyama, A. Komiya, T. Seki and T. Yambe (Tohoku University, Japan)

OS7-29

Prediction of Equivalence Ratio Oscillation Under Unchoked Injection Condition in Lean Premixed Combustion

H. J. Kim, J. G. Hong and H. D. Shin (KAIST, Korea)

OS7-30

Development of the Less Invasive Hemostatic Clamp Using a Superelastic Shape Memory Alloy Wire

S. Kodaira, Y. Luo, Y. Zhang, H. Miki and T. Takagi (Tohoku University, Japan)

OS7-31

Prediction of Frozen Region by Numerical Simulation during Cryosurgery Utilizing Peltier Cryoprobe

H. Takeda, S. Maruyama, S. Aiba, A. Komiya (Tohoku University, Japan)

OS7-32

Ignition and Quenching Characteristics of Premixed Flames in Heated Meso-scale Channel

Y. Tsuboi (Tohoku University, Japan), T. Yokomori (Keio University, Japan), K. Maruta (Tohoku University, Japan)

OS7-33

Numerical Analysis of Heat Transfer for an Externally Heated Radial Microchannel

S. Kumar (Indian Institute of Technology Bombay, India), A. Fan (Tohoku University, Japan), S. Minaev (Russian Academy of Sciences, Russia), K. Maruta (Tohoku University, Japan)

OS7-34

Scaling of a Natural Convection Flow Over an Evenly Heated Vertical Plate

T. Aberra, S.W. Armfield and M. Behnia (The University of Sydney, Australia)

Special Session

SHIRAKASHI 1

Chairperson H. Higuchi

September 26, 2007

- 13:10-13:45 **An Overview of Activities of Liaison Office through 21st Century COE Program “Flow Dynamics - International Research & Research Training”**
Masud Behnia (Dean of Graduate Studies, The University of Sydney, Australia)
- 13:50-14:10 **Establishing Academic Principle and Future Prospects of Flow Dynamics**
Shigenao Maruyama (Project Leader of International COE of Flow Dynamics, Institute of Fluid Science, Tohoku University, Japan)

Home-coming Session

ROOM 1

September 27, 2007

- 13:00-13:10 **Introduction of International Internship Program**
Toshiyuki Takagi (Tohoku University, Japan)
- Presentations by Alumni**
- 13:10-13:30 James Gregory (United States Air Force Academy, US)
- 13:30-13:50 Wataru Yamazaki (ONERA, France)
- 13:50-14:10 Takeshi Okuyama (Tohoku University, Japan)
- 14:10-14:30 Ryuta Ibuki (Miyagi University, Japan)
- 14:30-14:50 Takanori Takeno (Tohoku University, Japan)
- 14:50-15:00 **Summary of international internship program**
Shigenao Maruyama (Tohoku University, Japan)

Liaison Office Session

ROOM 1

September 27, 2007

- 16:40-17:00 **Advanced Integrated Research in Fluid Science**
Toshiaki Ikohagi (Director of Institute of Fluid Science, Tohoku University, Japan)
- 17:00-18:40 **Open Discussion for the activities of Liaison Office Multi-network**
Masud Behnia (Australia)
Joel Courbon (France)
Hiroshi Higuchi (USA)
Alexander Vasiliev (Russia)
Hyun Dong Shin (Korea)
Veronica Eliasson (Sweden)

Banquet

September 27, 2007 19:00-20:50 'SAKURA1'