The 4\textsuperscript{th} International Conference on HEAT TRANSFER and FLUID FLOW in MICROSCALE \\
\textit{HTFFM-IV} \\
September 4-9, 2011, Fukuoka, Japan

PROGRAM

Co-sponsored by 
Heat Transfer Society of Japan 
Engineering Conferences International 
International Center for Heat and Mass Transfer 
International Research Center for Hydrogen Energy, Kyushu University 
International Institute for Carbon-Neutral Energy Research, Kyushu University 
Japan Society for the Promotion of Science
General Information

Floor Plan of the Meeting Area
All the technical sessions will be held in the NAVIS ballroom on the first floor of Hilton Fukuoka Sea Hawk from September 4 to 9, 2011.

Registration
Registration desk will open at 15:30 on Sunday evening, September 4, 2011, at the First-floor Lobby of Hilton Fukuoka Sea Hawk. From Monday to Friday, Registration will be located in front of the session room, NAVIS, on the first floor. On-site registration is available only by cash of Japanese Yen. Attendee preferring credit-card payment has to pay the registration fee via Conference website. If the Bank transfer is the only way for you, contact to info@htffm-iv.org right now.

Welcome Reception
On Sunday evening, September 4, 2011, all attendees are invited to the Welcome Reception, which will be held at 17:30 to 19:30 at the NAVIS ballroom on the first floor of Hilton Fukuoka Sea Hawk.

Lunch and Banquet
Monday, September 5 through Thursday, September 8, a buffet style Conference lunch will be served on the same floor of the technical session. The Conference banquet will be on the 5th floor at 18:00 to 20:00 on Thursday, September 8, 2011. Dinner will be served as a buffet, with seating provided. All the registered attendees are invited to the Conference banquet and lunch. Tickets for accompanying persons are available on the registration desk.

Oral Presentation and Audio-Visual Aids
All the presentations except the Keynote Lectures are allocated for 20 minutes including discussion. Session room will have a full-color liquid crystal projector equipped with a connection cable with D-sub mini 15-pin male connector for RGB-video input from your laptop computers. Also a Windows PC with MS Power Point and Adobe Acrobat Reader will be available for your presentation by pre-installing your presentation via USB flash memory or CD-ROM. Speakers are strongly recommended to check your laptop and/or software compatibility before your session.

Poster Presentation
Each poster will be assigned a booth equipped with 90 cm width x 180cm height board with thumb tacks. It is recommended that posters be printed on a single sheets (e.g. A0-size with the shorter side at the top), but the final decision regarding the poster size is left to the authors. Each poster station
will have an identification number of your paper. Because the poster session will be held in the same room as the lunch, mount your poster during the coffee-break in the morning of September 6. It is the author’s responsibility to remove all the posters and clean the area before the end of the poster-session day.

Best Poster Award is planned to be given to a few distinguished posters and the winner will be announced in the Conference Banquet.
Organizing Committee

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Yasuyuki Takata, Kyushu University, Japan

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Gian Piero Celata, ENEA Casaccia, Italy
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Khellil Sefiane, University of Edinburgh, UK
Naoki Shikazono, The University of Tokyo, Japan
Peter Stephan, Darmstadt University of Technology, Germany
Yoshio Utaka, Yokohama National University, Japan
Xing Zhang, Tsinghua University, China

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Naoya Sakoda, Kyushu University, Japan
Technical Program

Monday, September 5, 2011

Opening Remarks
9:00-9:20, Monday, September 5
Conference Chair: Yasuyuki Takaka (Kyushu University, Japan)
President of Heat Transfer Society of Japan & Conference Co-Chair: Nobuhide Kasagi (The University of Tokyo, Japan)

Keynote Session 1
Chair: Peter Stephan
9:20-10:10, Monday, September 5

HTFFM-IV-KN1
Opportunities and challenges associated with the use of nanofluids
Khellil Sefiane (University of Edinburgh, UK)

Session 1-1 Boiling and Evaporation -1
Chair: Peter Stephan
10:10-10:50, Monday, September 5

HTFFM-IV-013
Effects of micro/nano-scale surface characteristics on the Leidenfrost point temperature of water
Hyungdae Kim (Kyung Hee University, Republic of Korea), Bao Truong, Jacopo Buongiorno, Lin-Wen Hu (Massachusetts Institute of Technology, USA)

HTFFM-IV-087
Transient growth process of precursor film at early stage of droplet spreading
Shota Hashimoto, Ichiro Ueno (Tokyo University of Science, Japan)

Session 1-2 Measurement Technique
Chair: Kenneth S. Breuer
11:10-12:30, Monday, September 5

HTFFM-IV-073
The flow characteristics of an evaporating ethanol water mixture droplet on a glass substrate
Yoshinori Hamamoto (Kyushu University, Japan), John R.E. Christy, Khellil Sefiane (The University of Edinburgh, United Kingdom)

HTFFM-IV-144
Experimental study on heat transfer to boiling bubble from superheated liquid layer
Tomohide Yabuki, Takuya Hamaguchi, Takayuki Kobayashi, Osamu Nakabeppu (Meiji University, Japan)

HTFFM-IV-145
Development of an infrared-based visualization technique to study phase dynamics on boiling surfaces
Hyungdae Kim (Kyung Hee University, Republic of Korea), Jacopo Buongiorno (Massachusetts Institute of Technology, USA)

HTFFM-IV-058
Temperature imaging of aqueous solution in microchannel using near-infrared absorbance characteristics of water
Naoto Kakuta, Yuko Fukuhara (Kyushu University, Japan), Katsuya Kondo (Tottori University, Japan), Hidenobu Arimoto (AIST, Japan), Yukio Yamada (The University of Electro-Communications, Japan)
Keynote Session 2  
Chair: Khellil Sefiane  
14:00-14:50, Monday, September 5  
HTFFM-IV-KN2  
Visualization and numerical simulation on subcooled pool boiling  
_Tomoaki Kunugi, Yasuo Ose, Zensaku Kawara_ (Kyoto University, Japan)

Session 1-3 Boiling and Evaporation -2  
Chair: Khellil Sefiane  
14:50-15:30, Monday, September 5  
HTFFM-IV-150  
Study on boiling heat transfer of mini-heat transfer surfaces  
_Yasuo Koizumi, Yoshiki Morita_ (Shinshu University, Japan)

Session 1-4 Numerical Simulation -1  
Chair: Mohammad Hassan Rahimian  
15:50-17:10, Monday, September 5  
HTFFM-IV-086  
Hybrid numerical approaches for modeling drop ejection, impact and coffee ring formation  
_Moussa Tembely_ (CNRS, France), _Anne-Gaëlle Mercier, Christine Nayoze_ (LCPEM, France), _Arthur Soucemarianadin_ (CNRS, France)

HTFFM-IV-027  
Entropy generation analysis of the channel sizing effect on the X-shaped micro-channels  
_Shu-Min Tu, Shuichi Torii_ (Kumamoto University, Japan), _Yang-Cheng Shih_ (National Taipei University of Technology, Taiwan)

HTFFM-IV-043  
Pore-scale numerical simulation of two phase flow of Newtonian and viscoelastic fluids  
_Johana Pinilla, Charles-Henri Bruneau_ (IMB Université Bordeaux 1 and INRIA MC² Team, France)

HTFFM-IV-020  
Mixed convective slip flows in a vertical parallel plate microchannel  
_Hamid Niazmand, Behnam Rahimi_ (Ferdowsi University of Mashhad, Iran)
Tuesday, September 6, 2011

Keynote Session 3
Chair: Gian Luca Morini
9:00-9:50, Tuesday, September 6
HTFFM-IV-KN3
Characteristics of evaporative heat transfer in the vicinity of a 3-phase contact line
Peter Stephan (Darmstadt University of Technology, Germany)

Session 2-1 Single Phase Flow - 1
Chair: Gian Luca Morini
9:50-10:50, Tuesday, September 6
HTFFM-IV-066
Numerical and experimental investigations of the hydraulic and thermal performance of rough micro channels
Katharina Jasch, Stephan Scholl (Technische Universität Braunschweig, Germany)
HTFFM-IV-037
A new prediction method based on one-dimensional theory for compressible fluid flow in micro-tubes
Shintaro Murakami (Maizuru National College of Technology, Japan), Yutaka Asako
(Tokyo Metropolitan University, Japan)
HTFFM-IV-097
Diffusion and mixing phenomena in micro-channel analyzed by the luminol chemiluminescence
Kaoru Yoshida, Ryosuke Matsumoto (Kansai University, Japan)

Session 2-2 Fuel Cell and Combustion
Chair: Masahiro Kawaji
11:10-12:30, Tuesday, September 6
HTFFM-IV-071
Breakthrough pressure in gas diffusion layer w/wo microporous layer using Xray tomography
Jongrok Kim, Junho Je, Seungwoo Doh (Pohang University of Science and Technology, Korea), Taesoo Kim (The Korea Atomic Energy Research Institute, Korea), Massoud Kaviany (University of Michigan, USA), Sang Young Son (University of Cincinnati, USA), Moo Hwan Kim (Pohang University of Science and Technology, Korea)
HTFFM-IV-131
Solid oxide fuel cells with an anode including proton conductors
Kohei Masuda, Manabu Ihara, Katsunori Hanamura (Tokyo Institute of Technology, Japan)
HTFFM-IV-111
Influence of wall temperature on surface reaction in ultra-micro combustor using hydrogen-air premixed mixture
Naoki Hayashi, Toshiki Imai, Hiroshi Yamashita (Nagoya University, Japan)
HTFFM-IV-113
Fluid simulation of diesel exhaust gas with particle deposition
Kazuhiko Yamamoto, Shinya Ohori (Nagoya University, Japan)

Poster Session
Chair: Yasunobu Fujita and Tohru Fukano
14:00-15:30, Tuesday, September 6
HTFFM-IV-018
On cooling effectiveness of Al2O3/water nanofluid in a minichannel heat sink
C.J. Ho, W.C. Chen (National Cheng Kung University, Taiwan)
Interphase heat transfer during bulk condensation at flow of vapor-gas mixtures
N.M. Kortsenshteyn (Khrzhizhanovsky Power Engineering Institute, Russia), A.K. Yastrebov (Moscow Power Engineering Institute, Russia)

Experimental study on micropump using rotational motion of magnetic material balls
Hiroshige Kumamaru, Fuma Sakata, Yoshio Nomura, Kazuhiro Itoh, Yuji Shimogonya
(University of Hyogo, Japan)

Experimental study on measurement of energy accommodation coefficient by low-pressure method
H. Yamaguchi, K. Kanazawa, Y. Matsuda, T. Niimi (Nagoya University, Japan)

Non-invasive velocity measurement of microchannel flow by Raman scattering imaging
Motoyuki Takahashi, Takahiro Takamatsu, Yohei Sato (Keio University, Japan)

Study on dynamics of liquid slug and instability of a liquid film in a microchannel
Yuichi Shibata, Taiga Takamine, Osamu Okamoto (Ibaraki National College of Technology, Japan), Masahiro Kawaji (City College of City University of New York, USA)

Characteristics of a thin liquid layer formed by a confined vapor bubble in a mini-gap between two parallel plates
Yaohua Zhang, Yoshio Utaka (Yokohama National University, Japan)

Quantum molecular dynamics study on energy transfer to an emitted electron in surface collision process of a particle
Masahiko Shibahara, Takeaki Yokoi (Osaka University, Japan), Shin-ichi Satake, Jun Taniguchi (Tokyo University of Science, Japan)

Accommodation coefficient investigation in all flow regimes: from hydrodynamic to near free molecular regimes
Mustafa Hadj-Nacer, Irina Graur, Pierre Perrier (Université de Provence-École Polytechnique Universitaire de Marseille, France)

Momentum and heat transport in nanoscale lubrication of alkane thin film sheared by self-assembled monolayer surfaces
Gota Kikugawa, Naofumi Yamamoto, Taku Ohara (Tohoku University, Japan)

Effect of non-condensable gases on interface resistance in microscopic dropwise condensation
Atsushi Tokunaga (Ube National College of Technology, Japan), Shota Yamawaki, Gyoko Nagayama, Takaharu Tsuruta (Kyushu Institute of Technology, Japan)

Phenomenological analysis of the friction coefficient in microtubes
Laurie Karim, Laurent Royon, Gerard Guillemen (Denis Diderot University, France)

SPH simulation of binary collision between liquid droplets with different physical properties
Yuta Hashimoto, Yasutaka Yamaguchi (Osaka University, Japan), Koji Kuroda, Tadashi Nakajima, Hideo Fujimura (Dai Nippon Printing Co., Ltd., Japan)

Flow visualization and numerical simulation of T-junction mixing of high-temperature high-pressure water to estimate natural convection
Filterless air cleaning with moisture thermal control method

Experimental and computational analysis of heat conduction of carbon nanotube pellet

Molecular dynamics simulation of phonon transport in suspended and supported graphene nanoribbons

Optimization of heat exchanger dimensions of a Joule-Thomson microcooler by simulation of performance

A micro-beam MEMS sensor for measurement of thermal conductivity of fluids at a steady state

The measurement of hydrogen gas viscosity with a curved vibrating wire method

Effect of roughness on the behavior of small droplet impinging onto a hot surface

Session 2-3 Numerical Simulation - 2

Chair: Bing-Yang Cao
15:50-17:30, Tuesday, September 6

Numerical simulation of the drying of inkjet-printed droplets

Red blood cell deformation in a capillary with a permeable wall simulated by immersed boundary lattice Boltzmann method

Numerical simulation of non-Newtonian pseudoplastic fluid in a micro scale channel using lattice Boltzmann method

CFD analysis of two-phase flow through microchannel using homogeneous equilibrium model (HEM)
The effects of variable properties on momentum and heat transfer of a spherical aerosol particle in slip flow regime

Behzad Mohajer, Vahid Aliakbar, Mehrzad Shams (K.N.Toosi University of Tech., Iran)
Wednesday, September 7, 2011

Keynote Session 4
Chair: Peng Zhang
9:00-9:50, Wednesday, September 7
HTFFM-IV-KN4
  Liquid film in micro tube two phase flow systems
  Naoki Shikazono (The University of Tokyo, Japan)

Session 3-1 Two Phase Flow
Chair: Peng Zhang
9:50-10:50, Wednesday, September 7
HTFFM-IV -094
  Flow patterns and pressure drop of adiabatic gas-liquid two-phase flow in a horizontal
  flat rectangular microchannel
  Hideo Ide, Kentaro Satonaka (Kagoshima University, Japan), Tohru Fukano (Kyushu
  University, Japan)
HTFFM-IV -101
  Theoretical study for high heat flux cooling by using phase change heat transfer in a
  microchannel
  Junnosuke Okajima, Atsuki Komiya, Shigenao Maruyama (Tohoku University, Japan)
HTFFM-IV -103
  Experimental and numerical investigation of viscous oil-water flow in a microchannel
  Hooman Foroughi (University of Toronto, Canada), M. Hossein Azadfar (City College of
  City University of New York, USA), Masahiro Kawaji

Session 3-2 Molecular Dynamics
Chair: Masahiko Shibahara
11:10-12:30, Wednesday, September 7
HTFFM-IV -133
  Molecular simulation of water adsorbed on mesoporous silica thin films
  Kyohei Yamashita, Hirofumi Daiguji (The University of Tokyo, Japan)
HTFFM-IV -033
  Molecular understanding of fast water flow through carbon nanotube membranes
  Laurent Joly, Kerstin Falk, Lydéric Bocquet (UMR 5586 Université Lyon 1 et CNRS,
  France)
HTFFM-IV -129
  Molecular dynamics analysis on the microscopic properties of single water and
  water-alcohol droplets at solid-liquid interface
  Donatas Surblys, Yasutaka Yamaguchi (Osaka University, Japan), Koji Kuroda,
  Tadashi Nakajima, Hideo Fujimura (Dai Nippon Printing Co., Ltd., Japan)
HTFFM-IV -112
  Thermal transport in single walled carbon nanotubes
  Wang Xiao-ming, Lu Shu-shen (Sun Yat-sen University, China)
Thursday, September 8, 2011

Keynote Session 5  
Chair: Osamu Nakabeppu  
9:00-9:50, Thursday, September 8  
HTFFM-IV-KN5  
Study on the thermal, electrical and thermoelectric properties of nanofilms  
Xing Zhang, Weigang Ma (Tsinghua University, China)

Session 4-1 Micro/Nano Devices  
Chair: Osamu Nakabeppu  
9:50-10:50, Thursday, September 8  
HTFFM-IV-132  
Estimation of heat dissipation in power MOSFET by electro-thermal analysis  
Tomoyuki Hatakeyama, Masaru Ishizuka, Shinji Nakagawa (Toyama Prefectural University, Japan), Katsuhirō Koizumi (Cosel. Co., LTD., Japan), Kazuyoshi Fushinobu (Tokyo Institute of Technology, Japan)  
HTFFM-IV-102  
Efficiency of a thermoelectric micro-generator  
Akihiro Yamamoto, Jun-ichiro Kurosaki, Yoshihiro Hashimoto, Koji Miyazaki (Kyushu Institute of Technology, Japan)  
HTFFM-IV-095  
Heat conduction through throat of graphene thermal nozzle studied by molecular dynamics simulation  
Bing-Yang Cao, Yuan-Wei Li (Tsinghua University, China)

Keynote Session 6  
Chair: Juergen J. Brandner  
11:10-12:00, Thursday, September 8  
HTFFM-IV-KN6  
Contact line dynamics at the nanoscale with and without evaporation  
Kenneth S. Breuer (Brown University, USA)

Session 4-2 Micro/Nano Fluidics - 1  
Chair: Juergen J. Brandner  
12:00-12:40, Thursday, September 8  
HTFFM-IV-076  
Analysis of a thermal transpiration rarefied gas flow: a circular cross section micro-tube submitted to a temperature gradient along its axis  
Marcos Rojas Cardenas, Irina Graur, Pierre Perrier, J. Gilbert Meolans (Université de Provence ‘Polytech’ Marseille, France)  
HTFFM-IV-134  
Enhanced energy accommodation of gas molecules on surfaces covered with single-walled carbon nanotubes: molecular beam experiment and Monte Carlo simulation  
Ikuya Kinefuchi, Jumpei Kawasaki, Junichiro Shiomi, Shu Takagi, Shigeo Maruyama, Yoichiro Matsumoto (The University of Tokyo, Japan)

I2CNER Lecture  
Chair: Yasuyuki Takata  
14:00-14:50, Thursday, September 8  
Fundamental of carbon nanotubes and their application to fuel cell catalyst  
Naotoshi Nakashima (Kyushu University, Japan)
Session 4-3 Heat Transfer Devices
Chair: Ching Jenq Ho
15:10-16:50, Thursday, September 8

HTFFM-IV -008
A new microstructure device for efficient evaporation of liquids
Juergen J. Brandner, Stefan Maikowske, Alice Vittoriosi (Karlsruhe Institute of Technology, Germany)

HTFFM-IV -121
Evaluation of flow characteristics in micro heat pipe manufactured in 3D integration semiconductor chip by high-speed imaging technique
Jun Nakatsuka (The University of Tokyo, Japan), Mitsuhisa Ichiyanagi (Sophia University, Japan), Ikuya Kinefuchi, Hideki Kitada, Yougsuk Kim (The University of Tokyo, Japan), Ryoichi Ohigashi (Dai Nippon Printing Co., Ltd., Japan), Takayuki Ohba, Yoichiro Matsumoto (The University of Tokyo, Japan)

HTFFM-IV -019
Heat transfer performance of a cryogenic heat pipe using nitrogen as working fluid
P. Zhang, Z. Q. Long, R. Z. Wang (Shanghai Jiao Tong University, China)

HTFFM-IV -015
Orientation effect on the convective boiling performance of a microchannel heat sink
Chi-Chuan Wang (National Chiao Tung University, Taiwan), Wen-Jeng Chang, Chia-Hsing Dai (Feng Chia University, Taiwan), Kai-Shing Yang (Industrial Technology Research Institute, Taiwan)

HTFFM-IV -151
Heat pipe mediated chemical processing in microstructured reactors
Holger Löwe, Raoul D. Axinte, Nadin Ehm (Johannes Gutenberg University, Germany)
Keynote Session 7
Chair: Irina Graur
9:00-9:50, Friday, September 9
HTFFM-IV-KN7
   Experimental techniques for the analysis of gaseous microflows
   Stephane Colin (University of Toulouse, France)

Session 5-1 Micro/Nano Fluidics - 2
Chair: Irina Graur
9:50-10:50, Friday, September 9
HTFFM-IV-054
   Experimental study of near wall electrokinetic transport of particles in microfluidics
   Qian Liang, Chun Yang, Jianmin Miao (Nanyang Technological University, Singapore)
HTFFM-IV-088
   Particle accumulation by ac electroosmosis in microfluidic device with co-planner electrodes
   Akihiko Ishida, Hikaru Toki, Masahiro Motosuke, Shinji Honami (Tokyo University of Science, Japan)
HTFFM-IV-069
   Experimental investigations of turbulent gas flow through a micro-tube
   Shinichi Matsushita, Chungpyo Hong (Tokyo University of Science, Japan), Yutaka Asako (Tokyo Metropolitan University, Japan), Ichiro Ueno (Tokyo University of Science, Japan)

Session 5-2 Single Phase Flow - 2
Chair: Stéphane Colin
11:10-12:10, Friday, September 9
HTFFM-IV-023
   Compressible gas flow through heated commercial microtubes
   Yahui Yang (DIENCA Alma Mater Studiorum Università di Bologna, Italy), Tom Schakenbos (Eindhoven University of Technology, Netherlands), Habib Chalabi, Marco Lorenzini, Gian Luca Morini (DIENCA Alma Mater Studiorum Università di Bologna, Italy)
HTFFM-IV-068
   Heat transfer characteristics of gas flow in micro-tubes with constant wall temperature
   Kyohei Isebe, Chungpyo Hong (Tokyo University of Science, Japan), Yutaka Asako (Tokyo Metropolitan University, Japan), Ichiro Ueno (Tokyo University of Science, Japan)
HTFFM-IV-078
   Enhancement of one-side actuating piezoelectric micro-pump using a frequency modulator
   H. K. Ma, H. C. Su, J. Y. Wu (National Taiwan University, Taiwan)

Closing Remarks
12:10-12:30, Friday, September 9