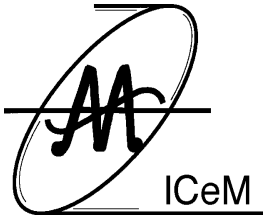
ISSN 1342-6966



The International Information Center for Multiphase Flow

NEWSLETTER

No.21
October 2003

The Japanese Society for Multiphase Flow

Lively Conference on Boiling Heat Transfer May 4-8, 2003, Montego Bay, Jamaica

by James F. Klausner, ICBHT Chair

The 5th International Conference on Boiling Heat Transfer (ICBHT) was kicked off on Sunday May 4, 2003 with a very interesting Keynote lecture by David Kenning entitled, Optical Studies of Boiling Heat Transfer: Insight or Mirage? The conference was held in Montego Bay, Jamaica with the beautiful Caribbean Sea as the backdrop. Conference participants were blessed with excellent weather and had an opportunity to relax along the sandy Jamaican beach while the conference was not in session. During the conference sessions the climate was a bit stormier with vigorous, but always respectful, debate.

Conference participants convened upon the Island of Jamaica from four different continents: Asia, Europe, North America, and South America. The quality of presentations at the conference was excellent, which covered topics such as experimental methods in boiling, boiling fundamentals, two-phase flow and heat transfer predictions, heat transfer and bubble formation, boiling heat and mass transfer at the microscale, high heat flux promotion, critical heat flux, and boiling of mixtures.

Some technical highlights of the conference included the introduction of a new automated high-speed video analysis technique for analyzing bubble dynamics presented by Reinhold Maurus from the Technical University of Munich. Hein Auracher from the Technical Univeristy of Berlin provided detailed experimental data and analysis explaining steady and transient heat transfer along the entire boiling curve. Masahiro Shoji from the University of Tokyo introduced unique experimental data on boiling features from artificial cavities. Yasuyuki Takata from Kyushu University introduced a plasma irradiation technique for creating hydrophilic metallic surfaces that increase the wetting limit and Leidenfrost temperature. Keith Hollingsworth from the University of Houston provided an excellent overview on the appropriate use of liquid crystal thermography in analyzing flow boiling heat transfer.

Whenever conference participants were starting to get a bit fatigued, Satish Kandlikar and John Thome could be counted on to liven up the atmosphere with a passionate debate.

At the conference banquet on Wednesday May 7, David Kenning was recognized for his lifetime contributions to the heat transfer community on the occasion of his retirement from Oxford University. Art Bergles was also recognized for his lifetime contributions to boiling heat transfer. John Chen and Dieter Gorenflo were given special recognition for their tireless efforts in promoting an improved understanding of boiling heat transfer and promoting participation in international conferences.

Although Larry Witte had to leave prior to the ban-

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Everybody, who is interested in “multiphase flow”, can be a member of ICeM. You are welcome to join ICeM. Please contact one of the following to register as an ICeM member.

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quet, he graciously passed along his jokes to the conference chairman, James Klausner, so that the banquet did not go down without some good laughs. Following the banquet, James Klausner provided additional entertainment by doing a rock and roll karaoke rendition of his favorite band.

The 5th International Conference on Boiling Heat Transfer was closed on the morning of Thursday, May 8, 2003. The Chairman for the next conference, to be held in 2006, is Gian Piero Celata from the Institute of Thermal-Fluid Dynamics in Rome. It is expected that Gian will provide information on the location for the next conference in the near future.

Frank Schmidt and James Klausner will serve as co-editors for a special edition of the Int. J. Heat and Fluid Flow that will feature a collection of papers from the ICBHT. It is expected that the special edition journal publication will be in print in early 2004. Those interested in a copy of the Proceedings of the 5th International Conference on Boiling Heat Transfer should contact James Klausner (klaus@ufl.edu). A fee will be required to cover the cost of printing.

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5th International Conference on Boiling Heat Transfer (ICHBT03) May 4-8, 2003, Montego Bay, Jamaica

by Paolo Di Marco

The 5th International Conference on Boiling Heat Transfer (ICHBT03) took place in Montego Bay, Jamaica, on the shore of the Caribbean Sea, from May 4 to 8, 2003. The Conference was efficiently organized by the Mechanical Engineering Department of the University of Florida at Gainesville, USA, under the direction of the meeting chairman, James F. Klausner. Gian Piero Celata, Keith Cornwell, Yasonobu Fujita and Jungho Kim co-chaired the event. This is the fifth meeting of a series started in S. Barbara, California, in 1992 after an idea of Vijay Dhir and John Chen, and entirely dedicated to pool and flow boiling heat transfer: the former conferences were held in Banff, Canada (1995), Irsee, Germany (1997), Girdwood, Alaska (2000).

The meeting was attended by about 75 participants, mostly from USA and Germany, and was divided into 14 sessions, which spanned all the aspects of boiling heat transfer from fundamentals to experimental methods, bubble formation, critical heat flux and dryout, microscale phenomena, boiling enhancement, and boiling of mixtures. 12 Keynote lectures and 49 contributed papers were presented.

The schedule of the meeting allowed time for open discussions, which found high interest with the audience and hosted live and sometimes passionate debate, always in the spirit of great respect and cooperation. Some of the topics discussed and advancements achieved are shortly listed in the following. The significant role of the solid surface was stressed in several instances, not only in terms of its nucleation sites, but also for its thermal inertia and aging: this must be considered a •greturning•h rather than a new issue. It is becoming increasingly clear that the phenomena taking place in the micro-region around the three-phase contact line of the bubble are the most important in determining boiling heat transfer, and several models were elaborated in this respect. The paramount role of nucleation site density and activation was also discussed: in this frame, several authors evidenced the importance of dissolved gas content for nucleation and the necessity to control this parameter during experiments, as well as provide its value in the reports. The uncertainty in physical models for bubble detachment and nucleation site density still prevents elaboration of reliable and complete numerical model of boiling heat transfer with bottom-up approach, though calculation capability is nowadays available. Finally, the need to consider flow pattern in heat transfer correlations for flow boiling was highlighted.

During the social dinner the celebration for the retirement of David Kenning took place, who had opened the meeting with a Keynote lecture entitled: “Optical Studies of Boiling Heat Transfer: Insight or Mirage?”. Keith Cornwell, with his British sense of humor, highlighted David’s main achievements of. The outstanding contribution of Art Bergles, John Chen and Dieter Gorenflo in promoting discussion and understanding of boiling heat transfer was also acknowledged.

The main papers presented at the meeting will be published in a special issue of International Journal of Heat and Fluid Flow, under the auspices of Frank Schmidt.

Finally, it was agreed that with 6th meeting of this series (ICHBT06) to take place in Italy in May 2006, being organized by Gian Piero Celata (chairman), John Thome and Paolo Di Marco. The exact location will be communicated shortly.

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Third International Symposium on Turbulence and Shear Flow Phenomena June 25-27, 2003, Sendai, Japan

by Toshio Miyauchi

The Third International Symposium on Turbulence and Shear Flow Phenomena was held at Sendai International Center from June 25 to 27, 2003. 139 Japanese researchers and 139 foreign researchers attended this symposium. Also, 21 accompanying persons attended. Major countries of the participants were: United States (31), France (18), Sweden (17), United Kingdom (17) and Germany (11). Because of the effect of SARS, there were no attendees from China, Taiwan and Singapore.

In this symposium, 5 invited lectures, 199 oral presentations in 36 sessions and poster presentations were delivered. On the first day, after the opening session, Professor Tsuji of Osaka University talked about gas-solid two-phase turbulence as an invited lecture. After this, parallel sessions of DNS, Turbulent Boundary Layer, Multi Phases Flow and Fundamentals were conducted. First sessions in the afternoon were RANS, Turbulent Boundary Layer, Multi Phases Flow and Fundamentals. After these sessions, a poster session was conducted. Final sessions of the first day were RANS, Turbulence Control, Separated Flow and Environmental Fluid Mechanics.

The second day was opened by an invited lecture of Professor Weinbaum of the City College, New York, the United States on bio-fluid dynamics. After this, Professor Shimomura of the University of Tokyo delivered an invited lecture on MEMS Application in Fluid Dynamics. The first sessions of the second day were Turbulence Control, Multi Phases Flow, Environmental Fluid Mechanics and General. The first sessions on the afternoon of the second day were Turbulence Control, LES, Free Shear Flow and Bio/Medical followed by another poster session. The last sessions of the second day were on Reacting Flow, LES, Experimental Methods and Coherent Structure/Dynamic Systems,

On the morning of the last day, Professor Vervisch of INSA de Rouen, France delivered an invited lecture on Turbulent Combustion. After this, Professor Bertoglio of CNRS-Ecole Centrale de Lyon, France talked about Two-Point Closures and Turbulence Modeling as an invited lecture. The first sessions on the morning of the last day were Turbulent Boundary Layer, Turbulence Control, Turbulent Heat Transfer and Aerodynamics. The first sessions in the afternoon were LES, Reacting Flow, Turbulent Heat Transfer and Free Shear Flow. The last sessions were LES, Reacting Flow, Compressible Flow and Free Shear Flow.

The papers of this Symposium were published as the Symposium Proceedings (Three volumes, 1244 pages). Selected papers from this symposium will be published in a special issue of the International Journal of Heat and Fluid Flow and Journal of Turbulence.

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Report on 4th ASME & JSME Joint Fluids Engineering Conference July 6-10, 2003, Hawaii, USA

by Ali Ogut

The 4th ASME & JSME Joint Fluids Engineering Conference, sponsored by Fluids Engineering Division (FED) of the American Society of Mechanical Engineers (ASME), and the Japanese Society of Mechanical Engineers (JSME) was held during July 6-10th in Honolulu, Hawaii.

The objective of this conference was to provide a forum for exchange of information related to fluids engineering for mechanical engineers from around the world representing academia, industry and government laboratories.

The Conference was organized by Prof. Ali Ogut, Rochester Institute of Technology, representing ASME, adoeme@rit.edu, and Prof. Yutaka Tsuji, Osaka University, tsuji@mech.eng.osaka-u.ac.jp, and Prof. Masaaki Kawahashi, Saitama University, mkawa@mech.saitama-u.ac.jp, representing JSME.

The Conference was a resounding success as it attracted 766 attendees from 33 Nations, including 134 students. The Conference Program included 714 papers in 179 Sessions, 6 Plenary Sessions, 2 Industrial Exchange Program Sessions, 28 Posters, and 4 exhibits. It also included a special symposium in memory of Prof. Charles G. Speziale, past Professor of Aerospace and Mechanical Engineering at Boston University, and a Student Paper Contest competition, sponsored by Fluent, Inc.

During the Conference Luncheon, awards were presented to 3rd (1999) ASME/JSME Joint Conference Chairs, Dr. Philip Pfund, and Dr. Toshiki Iino by JSME.

In addition 2003 Fluids Engineering, Lewis F. Moody, Robert T. Knapp awards were given to winning individuals. Awards were also given to Student Paper Contest winners.

If you wish to obtain further information on this Conference, you can contact any of the above organizers.

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http://www.asme.org/conf/fed03/

Photo
From left : Dr. Philip Pfund (Winners of JSME Award), Dr. Toshiki Iino (Winners of JSME Award), Dr. Upendra Rohatgi (Chair of ASME FED) and Dr. Hiroshi Hayami (Chair of JSME FED)

IEEES-1 The First International Exergy, Energy And Environment Symposium July 13-17, 2003, Izmir, Turkey

by Ibrahim Dincer, IEEES-1 Symposium

The First Exergy, Energy and Environment Symposium (IEEES-1) was a multidisciplinary/interdisciplinary international conference and provided a forum for researchers, scientists, engineers and practitioners from 37 countries to disseminate information, present new ideas and developments, and discuss the future direction and priorities in the fields of exergy, energy and environment.

The IEEES-1 was held in Izmir and the outcome of the presentations and discussions was found to be fruitful for both academia and industry. Also, it served as nourishment to the cooperation between academia and industry in terms of developing research programs in various areas of exergy, energy and environment.

The IEEES-1, which was the first international Symposium in this Symposium Series on Exergy, Energy and Environment, has received considerable international attention.

The IEEES-1 featured 4 keynote lectures and 173 general papers organized in sequence beginning with thermodynamics and heat and fluid flow, and progressing towards the blending of exergy, energy and environment with relevant disciplines in the pursuit of recent research results, reflecting the development of this very active field. The speakers covered a wide spectrum of educational backgrounds and research orientations, from engineering to physics, and from fundamentals to actual industrial applications.

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An Announcement from Editor

The JSMF gives internet-service for ICMF members.

You can read updated ICeM NEWSLETTER by visiting JSMF homepage

http://www.jsmf.gr.jp/index-en.html.

6th International Conference on Gas-Liquid and Gas-Liquid-Solid Reactor Engineering August 17-20, 2003, University of British Columbia, Vancouver, Canada

by Norman Epstein, GLS-6 Chair

The Sixth International Conference on Gas-Liquid and Gas-Liquid-Solid Reactor Engineering (GLS-6) was held at the University of British Columbia in Vancouver, Canada on August 17-20, 2003. The program consisted of three keynote papers ? on airlift bioreactors, on LC-Finer studies and on suspension of particles. A total of 94 additional papers were accepted and delivered, first as oral mini-presentations, then as poster displays and finally as subjects for discussion. In addition, 12 free-forum posters were displayed and subjected to discussion. The keynote papers and 72 of the additional papers were published in the Special June - August 2003 Issue of the Canadian Journal of Chemical Engineering, which was distributed to all Conference delegates along with 2-page summaries of the other papers, including the free-forum posters.

Five pairs of parallel sessions were held, as follows:

1A. Two-Phase Bubble Column Hydrodynamics
1B. Three-Phase Bubble Column Hydrodynamics
2A. Gas-Liquid Mechanics
2B. Stirred Systems
3A. Gas-Liquid Mass Transfer
3B. Computational Fluid Dynamics
4A. Chemical Reactors
4B. Measurement Techniques
5A. Monoliths, Packed and Trickle Beds
5B. Three-Phase Fluidization

The number of Conference registrants was 122.

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Executive Division of The Japanese Society for Multiphase Flow (2002-2003)

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Report of the 3rd Japanese-European Two-Phase Flow Group Meeting September 21-27, 2003, Certosa di Pontignano, Siena, Italy

by Gian Piero Celata

In the past three decades, world-wide activity in two-phase flow has greatly intensified. The number of journals, articles and the conferences that are specialized to two-phase flow significantly increased on all continents. The major impetus for the development of an intellectual framework for analyzing two-phase flows has been provided by needs of the nuclear industry and, to a lesser extent, by the petroleum and chemical engineering industry. Because of the complexity of problems and the urgent need for results, major developments have been •ghurried•h and have had, many times, a strong empirical component. Moreover, there has also been a lack in communication among the people working in different branches such as nuclear and chemical engineering. Consequently they were not accompanied, very often, with an advancement of the field of multiphase flow that has common roots. In recent years, interest by the nuclear industry has waned in many countries around the globe. There is, at present, no large overriding issue equivalent to the need of the nuclear industry for safe operations to drive advancements. However, multiphase flow problems abound in many industries and it is as much important as issue of understanding blood flow in our body. It is difficult to imagine how an engineer could stay in practice for a lifetime without being confronted with a multiphase flow problem whose solution will determine the success of a project.

Japan established the first Society for Multiphase Flow in 1987 (JSMF, the Japanese Society for Multiphase Flow, http://www.jsmf.gr.jp/index-en.htm).

Later, an initiative was taken in the US for establishing multiphase flow as a distinct discipline, thus creating IMuST, the Institute for Multiphase Science and Technology (http://crss.ucsb.edu/imust).

The European Two-Phase Flow Group was established in 1963 at the Royal Institute of Technology in Stockholm after the EAES Symposium on Two-Phase Flow, Steady State Burnout and Hydrodynamics Instability. It was founded by Professor Becker, who held a chair of Reactor Technology at the Royal Institute of Technology at the time. The main objectives of the meetings have been always the state of the art reports, synergism of academic and industrial circles and a special care for younger generations (http://termserv.casaccia.enea.it/eurotherm/etpfgm.html).

At the 2000 ETPFG Meeting in Karlsruhe, a new "virtual" Institute was founded and named the European Multiphase Systems Institute, EMSI. EMSI objectives are broadly to: i) promote, through research, discussion and scholarship, an understanding of multiphase systems for a range of applications; ii) encourage the setting up of collaborative projects with a European dimension, with a strong emphasis on fundamental aspects of multiphase systems, the aim being to provide a sounder basis for prediction in practical applications (http://www.emsi.fzk.de/).

The proposal to organize the first Meeting on Two-Phase Flow between Europe and Japan came from Japanese participants at the Japan-US Two-Phase Flow Seminar on Two-Phase Flow Dynamics in Fukuoka in 1996, with the aim to promote the information exchange and/or collaboration between Japanese and European scientists and engineers working on two-phase flow.

The First European-Japanese Two-Phase Flow Group Meeting was held in Portoroz, Slovenia, on June 1-5, 1998, organized by the Laboratory for Fluid Dynamics and Thermodynamics of the University of Ljubljana, in collaboration with the Japanese Society for Multiphase Flow and the Institute of Engineering Mechanics and Systems of the University of Tsukuba, and was attended by 41 experts, 15 from Japan.

The 2nd Japanese-European Two-Phase Flow Group Meeting was held in Tsukuba from September 25th to 29th, 2000, organized by the Institute of Engineering Mechanics and Systems of the University of Tsukuba, in collaboration with the Laboratory for Fluid Dynamics and Thermodynamics of the University of Ljubljana, and the Institute of Thermal- Fluid Dynamics of ENEA, Rome. The Meeting was attended by over 70 participants from 13 different countries. The total number of contributions was 51, 17 from Europe, and, among these, there were 5 joint papers between Europe and Japan. The following Countries formally participated at the Tsukuba Meeting: Austria, Czech Republic, France, Germany, Italy, Japan, Portugal, Slovenia, Switzerland and UK.

Considering the success of the first two editions of the European-Japanese Meeting on Two-Phase Flow, at the Tsukuba Meeting it was decided to hold this Meeting every third year, and the 3rd edition to be held again in Europe, and specifically in Italy.

The decision to hold this Meeting at the Certosa di Pontignano was made among chair and co-chairs, in view of the wonderful location of this ancient Carthusian abbey built in the XIV Century, completely restored and fully equipped with the most advanced facilities for conferences, close to Siena and in the heart of Tuscany. The Certosa di Pontignano allows a meeting of the residential type, with all participants lodging inside the meeting place, having breakfast, lunch and dinner all together in a friendly, quiet and constructive atmosphere. The unique features of this meeting, shaped similar to the European Two-Phase Flow Group Meeting, are:

o No advance paper submission but last minute papers brought at the Meeting by participants, i.e., fresh material for discussion
o Informal and friendly atmosphere
o Sufficient time for discussion
o Sufficient time for social events and relaxing

Three outstanding lecturers have been delivered at the Meeting:

o Professor Yoichiro Matsumoto, dealing with biomedical application of micro-bubbles
o Professor Goichi Matsui, dealing with simultaneous visualization of particle/bubble
o Professor Iztok Zun, dealing with the principles of complexity in bubbly flow

More than 60 participants attended the Meeting and a total of 50 papers has been presented at the Meeting dealing with interfacial phenomena, boiling heat transfer, void fraction, microstructures, waves, bubble dynamics, bubbly flow, computational methods, measurements, transient and dynamic analysis, droplet and particle flow, flow pattern and transition, jets, slug flow. A good deal of variety testifying the vitality of the two-phase flow community and the many fields of interest which this discipline spreads on. Topics dealt with in the papers suggest that two-phase flow research grows in new directions. The trends are remarkable in the fields of measurement, simulation and applications. The Meeting was active and fruitful, and useful interchange in various directions was promoted during the Meeting.

A CD-ROM containing the pdf files of all papers presented at the Meeting will be prepared after the Meeting and distributed among participants. Pre-print copies of the papers have been distributed among participants at the Meeting. A selection of papers presented will be published in the Experimental Thermal and Fluid Science and Multiphase Science & Technology Journals.

Details about the technical program of the Meeting can be found at:

http://termserv.casaccia.enea.it/etpfgm3_jp/Progfin.html

It was confirmed to continue the series of joint meeting every three years under the umbrella of The European Multiphase Systems Institute (EMSI) and The Japanese Society for Multiphase Flow (JSMF). The fourth Meeting is scheduled for late September 2006 in Kyoto, Japan. Chairman for this Meeting will be Prof. Kaichiro Mishima (mishima@rri.kyoto-u.ac.jp). Co-chairs will be Prof. Akio Tomiyama for Japan, and Prof. Iztok Zun and Dr. Gian Piero Celata for Europe.

Information will be posted in internet and be accessible through the web page of the European Two-Phase Flow Group (http://termserv.casaccia.enea.it/eurotherm/etpfgm.html).

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The 3rd European-Japanese Two-Phase Flow Group Meeting September 21-27, 2003, Certosa di Pontignano, Italy

by Tomio Okawa

The 3rd European-Japanese Two-Phase Flow Group Meeting was held in Certosa di Pontignano, Italy. The meeting was organized by ENEA, University of Ljubljana, University of Kobe, University of Pisa and Japanese Society for Multiphase Flow with the support of AVL Powertrain Engineering and Nuclear Power Engineering Corporation. The meeting was completely successful as in the two previous ones held in Portoroz, Slovenia (1998) and in Tsukuba, Japan (2000). I would like to express sincere thanks to the meeting chair, Dr. Gian Piero Celata, the co-chairs, Prof. Iztok Zun and Prof. Akio Tomiyama, the secretary, Prof. Paulo di Marco and Dr. Andrea Mariani for their effort to offer us this nice meeting.

In the meeting, the following three stimulating invited lectures on the application, measurement and mechanisms of two-phase flow were given:

- Y. Matsumoto, Bio-medical application of micro-bubbles
- G. Matsui and H. Monji, Simultaneous visualization of particle/bubble behavior and surrounding flow
- I. Zun, The principles of complexity in bubbly flow

About 50 papers that were presented from 14 countries covered the following fundamental and applied topics of two-phase flow:

- Interfacial phenomena (2 papers)
- Boiling heat transfer (3 papers)
- Void fraction (3 papers)
- Microstructures(1 paper)
- Waves (1 paper)
- Bubble dynamics (5 papers)
- Bubbly flows (3 papers)

- Computational methods (7 papers)
- Measurements (5 papers)
- Transient and dynamic analyses (4 papers)
- Droplet and particle flow (5 papers)
- Flow pattern & transition (2 papers)
- Jets (4 papers)
- Slug flow (5 papers)

It was recognized from the presentations that the global structure of two-phase flow is significantly governed by the micro scale phenomena; much effort is being made to achieve improved understanding of micro scale structure of two-phase flow through analytical, experimental and numerical works.

The meeting was held in an informal atmosphere with casual clothing. This encouraged the fruitful discussion on each presented topic. All the participants lodged the comfortable rooms in the meeting place and had all the meals together. Italian foods including pasta, meat, soup, salad and wine were undoubtedly excellent. In particular, it was difficult to escape from the meeting place since the place was almost isolated from the other world. These helped us being very friendly with each other. I wish to express my sincere appreciation once more to all the persons who planned, prepared or executed this distinctive meeting.

Before closing this report, I would like to mention the blackout that struck Italy in the early morning following the meeting. Because of this problem, my plane was delayed for ten hours. I guess that other participants from foreign countries experienced similar situation. In my case, however, I could have extra discussion with some Japanese participants who were also kept in the Fiumicino airport in Rome. Although the discussion time might be too long, it was also fruitful. For this reason, the unexpected blackout was rather good fortune than misfortune for me.

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Future Meetings

Following list includes Conference Name, Place, Date and Contact.

Tenth International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-10)
Seoul, Korea, October 5-9, 2003
Prof. Won-Pil Baek
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http://www.nureth10.org

4th International Symposium on Turbulence, Heat and Mass Transfer
Antalya, Turkey, October 12-17, 2003
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Second International Conference on Computational Methods in Multiphase Flow
Santa Fe, New Mexico, USA, November 3-5, 2003
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http://www.wessex.ac.uk/conferences/2003/multiphase03/

International Conference on Power Engineering - 03 (ICOPE-03)
International Conference Center Kobe, Port-Island, Kobe, Japan, November 9-13, 2003
Prof. Terushige Fujii
Kobe University
USA: Prof. David Y.S. Lou
Prof. J.K. Ludwickson
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http://www.jsme.or.jp/pes/ICOPE-03

ANS/ENS International Winter Meeting
New Orleans, USA, November 16-20, 2003
http://www.ans.org/meetings/

AIChE 2003 Annual Meeting
San Francisco, CA, USA, November 16-21, 2003
Prof. Michael F. Malone
MPC-Meeting Program Chair
University of Massachusetts, Amherst
Email: aiche03@ecs.umass.edu
http://www.aiche.org/conferences/

International Symposium on Micro-Mechanical Engineering (ISMME 2003)
Tsuchiura, Ibaraki, Japan, December 1-2, 2003
Tsukuba, Ibaraki, Japan, December 3, 2003
Dr. Shigeki Hirasawa
Mechanical Engineering Research Laboratory, Hitachi, Ltd.
502 Kandatsu, Tsuchiura, Ibaraki, 300-0013, Japan
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Fax: +81-298-32-2804
E-mail: hira@merl.hitachi.co.jp
http://www.jsme.or.jp/ted/ISMME.html

Third International Conference on Computational Fluid Dynamics in the Minerals & Process Industries
Melbourne, AUSTRALIA, December 10-12, 2003
Dr. Phil Schwarz
Science Advisor - Process Modelling & Devl'ment
Coordinator - CFD Team
CSIRO – Minerals
Box 312
Clayton Sth, Victoria
Australia 3169
Tel: +61-3 9545 8568
Fax: +61-3 9562 8919
Email: phil.schwarz@csiro.au
http://www.cfd.com.au/cfdconf

The 1st International Symposium on Micro & Nano Technology (ISMNT-1)
Honolulu, Hawaii, USA, March 14-17, 2004
Dr. Makoto Inoue
President
Komatsu Electronics Inc.
E-mail: makoto_inoue@komatsu.co.jp
Prof. Masaru ISHIZUKA
Toyama Prefectural University
E-mail: ishizuka@pu-toyama.ac.jp
http://www.ismnt.com

14th Pacific Basin Nuclear Conference
Honolulu, Hawaii, Sheraton Waikiki Hotel, March 21-25, 2004
Dr. Gail H. Marcus
U.S. Department of Energy
Mr. E. James Reinsch
Bechtel Power Corporation
Dr. Ellen Leitschuh
American Nuclear Society
Tel: 708/579-8253
Fax: 708/352-6464
E-mail: eleitschuh@ans.org
http://www.ans.org/meetings/pdfs/2004/pbnc2004-cfp.pdf

CHT-04 Advances in Computational Heat Transfer
Kirkenes, Norway, April 1-6, 2004
Prof. Graham de Vahl Davis
Prof. Eddie Leonardi
CFD Research Laboratory,
School of Mech. & Manuf. Engineering,
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Tel: (+61 2) 9385 4099 / 4254
Fax: (+61 2) 9663 1222
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CHT-04: International Symposium on Advances in Computational Heat Transfer
Kirkenes and Bergen, Norway, April 19-24, 2004
Professors Graham de Vahl Davis
Professors Eddie Leonardi
School of Mech. & Manuf. Engineering
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Tel: +61 2 9385 4099
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Email: cht04@cfd.mech.unsw.edu.au
http://cht04.mech.unsw.edu.au/

5th Minsk International Heat and Mass Transfer Forum - MIF-2004
Minsk, Belarus, Russia, May 24-28, 2004
Dr. O. Martynenko
Dr. I. Gurevich
A.V.Luikov Heat and Mass Transfer Institute
National Academy of Sciences of Belarus
15, P. Brovka St., Minsk, 220072, Belarus
Tel: +375 (17) 284-21-36
Fax: +375 (17) 232-25-13
Email: igur@hmti.ac.by
http://www.itmo.by/forum/mif5/

5th International Conference on Multiphase Flow (ICMF-2004)
Yokohama Pacifico Conference Center,
Yokohama, Japan, May 31- June 3, 2004
Conference Chair
Prof. Y. Matsumoto
University of Tokyo
Email: icmf@jsmf.gr.jp
http://www.jsmf.gr.jp/icmf/

ASME TURBO EXPO 2004
Vienna, Austria, June 14-17, 2004
Dr. Sigmar Wittig
German Aerospace Center (DLR)
Koln, Germany
ASME International Gas Turbine Institute
5775-C Glenridge Dr., Suite 115
Atlanta, GA 30328 USA
Tel: 1-404-847-0072
Fax: 1-404-847-0151
E-mail: igtiprogram@asme.org
http://www.asme.org/igti/events/te2004/04committee_topics.html

Second International Conference on Microchannels and Minichannels
Rochester, NY, USA, June 17-19, 2004
Prof. Satish G. Kandlikar
ME Department, R.I.T., Rochester, NY, 14623, USA
Tel: (585) 475-6728
Fax: (585) 475-7710
E-mail: sgkeme@rit.edu
http://www.asme.org/events/micromini/call.html

RAD-04: International Symposium on Radiative Transfer
Istanbul, Turkey, June 20-25, 2004
Professor M. Pýnar Menguç
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Lexington, KY 40506-0108
Tel: +1 859-257- 2673
Fax: +1 859-257-3304
E-mail: menguc@engr.uky.edu
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Fax: +90-312-210 1264
E-mail: selcuk@metu.edu.tr
http://www.ichmt.org/Rad-04

3rd International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics (HEFAT2004)
Cape Town, South Africa, June 21-24, 2004
Prof. JP Meyer
Department of Mechanical and Aeronautical Engineering
University of Pretoria
Pretoria, 0002, South Africa
Tel.: +27 12 420 2590
Fax: +27 12 362 5124
E-mail: jmeyer@up.ac.za
E-mail: hefat2004@mweb.co.za
http://www.hefat.com

5th International ASME/JSME/KSME Bi-Annual Symposium on Computational Technology (CFD) for Fluid/Thermal/Chemical/Stressed Systems with Industrial Applications
San Diego (La Jolla), California, USA, July 25-29, 2004
for Americas:
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E-mail: crkleijn@klft.tn.tudelft.nl
http://www.cfdcanada.com/pvp04.html

The ILASS (Institute for Liquid Atomisation and Spray Systems) Europe meeting
Nottingham, UK, September 2004
Prof. Barry Azzopardi
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University Park
NG7 2RD Nottingham
ENGLAND
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Fax: 44 (0) 115 951 4115
Email: barry.azzopardi@nottingham.ac.uk

3rd International Symposium on Two-Phase Flow Modelling and Experimentation
Pisa, Italy, September 22- 24, 2004
Dr. Gian Piero Celata
ENEA Casaccia, Institute of Thermal-Fluid Dynamics
Via Anguillarese, 301, I-00060 S.M. Galeria, Rome, Italy
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E-mail: rkshah@attglobal.net
http://www.ing.unipi.it/pisa04/

6th International Topical Meeting on NUclear Reactor Thermal Hydraulics, Operations and Safety (NUTHOS-6)
Nara-Ken New Public Hall, Nara, JAPAN, October 4-8, 2004
Dr. Mamoru Akiyama
Inst. Applied Energy
E-mail: info@nuthos6.org
http://www.nuthos6.org/

AIChE 2004 Annual Meeting
Austin, TX, USA, November 7-12, 2004
http://www.aiche.org/conferences/

The 13th International Heat Transfer Conference
Sydney, NSW, Australia, August 13-18, 2006
Professor Graham de Vahl Davis
Professor Eddie Leonardi
School of Mechanical and Manufacturing Engineering
The University of New South Wales, Sydney, Australia
Fax: +61 2 9663 1222
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GPO Box 128, Sydney 2000, Australia
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