

The International Information Center for Multiphase Flow

**NEWSLETTER**

No.12

April 1999

The Japan Society of Multiphase Flow

**Report on the 6TH Asian Conference on Fluidized Bed and Three-Phase Reactors  
Cheju Island, Korea, December 8 - 12, 1998**

by Y. KANG

Technology related to the fluidized-bed and three-phase reactors has been an extremely important subject in engineering research, and has played a major role in the development of emerging technology. The Asian Conference on Fluidized-Bed and Three-Phase Reactors was to provide a forum to promote the exchange of technical and scientific information in the academic and industrial sectors in the field of fluidized-bed and three-phase reactors among Asian countries. The first conference was held in Tokyo, Japan, 1988, the second conference in Kenting, Taiwan, 1990, the third conference in Kyungju, Korea, 1992, the fourth conference in Fukuoka, Japan, 1994, and the fifth conference was held in Hsitou, Taiwan, 1996. Previous five conferences gave us excellent opportunities to get acquainted each other and to share advanced information in the field of fluidized-bed and three-phase reactors. After five successful conferences, the sixth conference was held in Cheju Island, Korea during December 8-12, 1998. This conference was sponsored by the Korean Institute of Chemical Engineers, The Society of Chemical Engineers, Japan, and the Chinese Institute of Chemical Engineers -Taipei. The Hotel Shilla, which was the place of the conference, is the premier resort hotel in South Korea's scenic vacation island Cheju. Their three deluxe restaurants offered cuisine to meet many tastes of modern society. The Cheju Island which is known as a place of fantasy or mystery is the largest island in Korea and is lo-

cated in the southeast sea of the Korean Peninsula and is highlighted for its uniqueness. The conference consisted of 15 oral sessions, 2 poster sessions and 3 special technical sessions. The titles of oral sessions include Gas/Solid Hydrodynamics; Turbulent and Circulating Beds; Gas/Solid Heat and Mass Transfer; Bubble Column and Reactors; Energy and Environmental Control System; Three-Phase Reactors and Fluidized Beds; Gas/Solid Reactors and Combustion; Industrial Applications; Bio-reactor and Applications. In the special technical sessions, 16 special lectures related to the fluidized-bed incinerator and actual application of incineration technology in the industry had been delivered by means of speakers from company. During the conference, more than 100 original papers had been presented in oral or poster sessions and more than 300 persons attended at the conference. The luxurious reception, welcome party, farewell dinner and three-times lunch had been served to all participant freely.

The next conference will be held in Hamamatsu, Japan, 2000.

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Everybody, who has an interest in "multiphase flow", can become a member of ICeM. ICeM welcomes his/her joining. Please contact either of the following to register in ICeM.

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## Report on Eurotherm Symposium No.61: Detailed Studies of Combustion Phenomena Eindhoven, The Netherlands, October 12-14, 1998

by L.P.H. de Goeij

The 61st Eurotherm Seminar, entitled Detailed Studies of Combustion Phenomena, took place in the Golden Tulip Hotel Central in the Centre of s' Hertogenbosch, The Netherlands, from October 12th to October 14th. It was hosted by the J. M. Burgers Centre for Fluid Mechanics and Eindhoven University of Technology, The Netherlands.

Pursuing the aims of the EURO THERM seminars, the seminar intended to bring together a specialist group which is involved in detailed studies of combustion phenomena and to stimulate discussion and liaison between these researchers. All the observed phenomena in combustion are based on the underlying physical and chemical processes such as heat and mass transfer, flow, and chemical reaction. In order to improve existing combustion technologies a detailed understanding of these processes is necessary. Thus the scope of the seminar focused on the physical modelling on the physical and chemical processes in flames and the validation by detailed measurements of velocity-, temperature- and concentration fields.

The resonance of the scientific community following the call for papers and the large number of papers submitted for presentation at the seminar showed that the scope of the seminar attracted many researchers. The decision about acceptance for presentation was based on short abstracts which were reviewed by the scientific committee (Dr. L. P. H. de Goeij (Chairman), Prof. Dr. U. Maas (Co-chairman), Dr. H. B. Levinsky, Prof. R. P. Linstedt, Prof. Dr. J. J. ter Meulen, Prof. Dr. N. Peters, Prof. Dr. P. Roth, Prof. Dr. D.J.E.M. Roekaerts and Prof. Dr. A. A. van Steenhoven).

Based on the decision of the scientific committee 31 contributions of researchers from 12 countries (Belgium, France, Germany, Greece, Italy, Poland, Portugal, Spain, Sweden, the Netherlands, the United Kingdom and the United States of America) were accepted for presentation at the seminar. Furthermore two invited lectures by S. Candel, France (on numerical combustion) and by M. Alden, Sweden (on Combustion diagnostics) were given at the seminar. In total the number of 69 participants were registered.

The technical programme was divided into six main topics, namely combustion diagnostics, NO<sub>x</sub>-formation, soot and particles, laminar flame modelling, turbulent flame modelling, and large scale combustion. The large number of presentations in the field of NO<sub>x</sub>-formation and soot and particles, which was manifested by the fact that special sessions were devoted to these issues, shows that pollutant formation in combustion processes is an ac-

tive field of research and furthermore that only detailed studies of combustion phenomena can improve our understanding of kinetically controlled pollutant formation.

The first session was devoted to Combustion Diagnostics. It started with an invited presentation given by M. Alden (Lund Institute of Technology, Sweden) on Laser Spectroscopic Techniques for Combustion Diagnostics. In his talk Alden gave an overview of laser-spectroscopic methods in combustion which allow non-intrusive measurements of concentration and temperature fields. Such experimental methods are needed both to validate and to improve mathematical models of combustion processes. Also the other presentations in this session showed that accurate diagnostic methods are needed for a detailed understanding of the physical and chemical processes in flames. The contributions in the session on NO<sub>x</sub>-formation covered both experimental and modelling studies. The main emphasis was on kinetic modelling based on detailed reaction mechanisms. This stems from the fact that NO<sub>x</sub>-formation is a kinetically controlled process which can only be understood if the underlying chemistry is considered in detail. The same is true for soot formation which was the topic of the following section. Furthermore, presentations on the combustion of particles such as pulverized coal showed interesting new results on modelling of heterogeneous combustion processes.

After the sessions on the first day of the seminar there was the possibility for the attendants of the seminar to visit the Eindhoven University of Technology and to have a tour through the laboratories for combustion research.

The presentations of the second day were devoted to laminar and turbulent flame modelling. The morning session on laminar flame modelling covered a broad range of different topics, including fundamental aspects of laminar flames, multi-species transport models, robust numerical methods for laminar flame simulation, transient flame structures and laminar flamelet models. In the session on turbulent flame modelling, which was continued on the following day, presentations focused not only on modelling of premixed and non-premixed flames, but also on interesting issues such as sound generation by turbulent flames.

The last day of the seminar continued with the presentations on turbulent Flame Modelling. The session started with an invited talk given by S. Candel (CNRS Paris, France) on Progress in Numerical Combustion. S. Candel gave a very interesting overview of methods in turbulent flame modelling and

covered many different aspects ranging from direct numerical simulations over large eddy simulations to statistical models. The presentation showed clearly the state of the art in turbulent flame modelling, but also emphasized shortcomings of the existing models. The other presentations in this session covered different aspects of turbulent flames ranging from studies in internal combustion engines to PDF-modelling. The last session of the seminar was devoted to large scale combustion. Presentations included modelling of waste incinerators and large scale explosions.

As mentioned above the seminar attracted a large number of researchers in the field of combustion. The topics of the seminar covered a broad range of different aspects of combustion - from experimental methods over theoretical analysis to numerical modelling, and from small-scale laboratory systems to large scale industrial applications. The presentations showed clearly that an improvement of existing combustion technologies has to be based on a detailed understanding of the underlying physical and chemical processes. Lively discussions after the

presentations, which were critical, but always friendly, enabled an intense exchange of ideas.

Thus, the objectives of the seminar, namely the exchange of recent progress in modelling and experimental investigation of the physical and chemical processes in flames, and the discussion of the current knowledge in view of an improved understanding and design of practical combustion systems were met, and we believe that the seminar was very successful.

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### To Members

For forthcoming data bank on Multiphase Flow Research/Researchers, ICeM would like to have your personal data. Please write your name, address, research field and a list of papers etc. to the Editor.

ICeM would also be very grateful to receive recent reprints, along with up to five keywords per paper.

ICeM welcomes research articles on multiphase flow or articles on personalities in the field for inclusion in the future Newsletters. It would be very helpful if the manuscripts are sent by E-mail or diskettes are attached to the manuscript submitted.

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Please address information on multiphase flow researches and researchers to the Editor. Also, please invite colleagues working on multiphase flow in your country to join ICeM.

## Report on THE FOURTH KSME-JSME FLUIDS ENGINEERING CONFERENCE Pusan, Korea, October 18-21, 1999

by Moon Joo Lee

The Fourth KSME-JSME Fluids Engineering Conference (FEC4 in short) was held in Pusan, Korea during October 18-21, 1999 organized under the joint auspices of the Korean Society of Mechanical Engineers (KSME) and Japan Society of Mechanical Engineers (JSME).

The Conference was designed to provide a forum for exchanging new concepts, approaches and discoveries in fluid mechanics and applications and to promote active communications among the engineers and scientists of fluids engineering in Korea and Japan. Furthermore, the Conference period and venue were carefully selected to provide a pleasant atmosphere for the participants to enjoy the meeting as well as to acquaint with new friends. The conference site, Hotel Paradise Beach, is located right at the famous Haeundae Beach which has a unforgettable beautiful scenery and comfortable weather during autumn.

The FEC4 is the fourth in a row of the joint conferences of KSME and JSME in fluids engineering with its successful predecessors held previously

- 1st: Seoul, Korea, Nov. 1-3, 1988
- 2nd: Seoul, Korea, Oct. 10-13, 1990
- 3rd: Sendai, Japan, July 25-27, 1994

At this conference, there were 202 papers presented in 46 technical sessions (40 general sessions and 6 invited lectures) encompassing a wide variety of topics in the field of fluids engineering. Among these, 105 papers were submitted by authors affiliated with Korean institutions and 96 were contributed from Japan. The contributed papers were presented in quadruple sessions and the invited lectures were delivered in doublets. The scope of the papers presented at the conference includes:

- Applications
- Combustion
- Compressible Flow
- Drag Reduction
- Environmental Flows
- Experimental Methods
- Flow around a High-Speed Train
- Flow Control
- Flow in a Container
- Flow Noise
- Flow with Heat Transfer
- General Fluid Dynamics
- Internal Flows

- Jet Flows
- Magneto- and Electro-Hydrodynamics
- Non-Newtonian and Bio fluid Flows
- Numerical Methods
- Spray
- Stability
- Two-Phase Flow
- Turbomachinery
- Turbulent Flows
- Wake

Invited talks were delivered by Prof. Kwang June Bai (Seoul Nat'l. Univ., Seoul), Prof. In Seok Kang (Postech, Pohang), Dr. Yutaka Kawata (Mitsubishi Heavy Ind., Takasago), Prof. Hideo Ohashi (Kogakuin Univ., Tokyo), Dr. Michitoshi Takagi (Nissan Motor, Yokosuka), Prof. Jung Yul Yoo (Seoul Nat'l. Univ., Seoul) The Co-chairmanship of the organizing committee was served by Prof. Choung Mook Lee (Postech) and Prof. Toshio Kobayashi (U. of Tokyo).

The duties of the conference secretariats were taken by Prof. Moon J. Lee (Postech) and Prof. Yoichiro Matsumoto (U. of Tokyo). The Conference Proceedings bound in one volume with 831 pages contain all the papers presented at the conference, programs, committees of the conference and author index.

Organization of FEC4 was facilitated greatly by operation of the conference website located at <http://mech.postech.ac.kr/FEC4>, which allowed faster, more convenient and efficient solutions to most tasks of organization and preparation of the conference.

We wish to express our sincere gratitude to all those who have contributed a great deal to the success of the conference despite the recent economic difficulties in both countries. They are the authors, invited speakers, session co-chairmen, members of the organizing committees of both countries, the host committee and student aids, the advisory board and participants of the conference.

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**Report on Characterization of Flow Patterns in Multiphase Flow Systems,  
International Mechanical Engineering Congress & Exposition-IMECE'98  
November 15-20, 1998, Anaheim, California**

by Jovica R. Riznic

More than a hundred researchers, academics and practitioners attended the Symposium on Characterization of Flow Patterns in Multiphase Flow Systems at the ASME International Mechanical Engineering Congress & Exposition (IMECE'98), held in Anaheim, California, November 15 to 20, 1998. The meeting was chaired by Cila Herman (Johns Hopkins University) and Jovica Riznic (Atomic Energy Control Board). A total of thirty-four papers, including four keynote lectures, from fifteen countries was presented. These papers emphasized both the fundamental and the technological aspects of flow regimes in multiphase flow. The topics covered a very broad field, ranging from characterization of void fraction and pressure signals, over neural networks and time series analysis, nonlinear dynamics and complex systems identification methods, to identifications of chaos in multiphase flows and control of chaos, industrial and laboratory applications in fluidized beds, boiling systems, combustion, manufacturing and material processing technologies.

The four keynote lectures focused on recent advances and future directions in characterization and identification of flow patterns in various multiphase flow systems. Gad Hetsroni (Technion) showed new videos of thermal structures on a heated wall, where the temperature pattern on the wall was studied as related to the structure of the flow field. This work was aimed at revealing the relations between fluctuating values of the pressure and temperature, the thermal structure on the heated wall, and the heat transfer coefficient in the bubble and slug air-water flow. Mamoru Ishii (Purdue University) reviewed attempts to introduce objective approaches for characterizing the interfacial structures and identifying flow regimes in two-phase flow. One of the most promising methods is based on the use of a multi-sensor probe technique to get detailed local information. He introduced a novel methodology employing an advanced multi-electrode impedance void-meter and neural networks. Both supervised and self-organized neural network classifiers were developed to identify flow regimes. Stuart Daw (Oak Ridge National Laboratory) gave an overview of data symbolization as a tool for identifying temporal patterns in complex measurement signals. In his lecture, Stuart discussed both general issues associated with the application of symbolization and symbol statistics as well as specific implementations of these ideas in analyzing signals from fluidized beds. Expected benefits from using symbolization include the

implementation of real-time process monitoring, reduced computational overhead, and improved model assessment. Cor. van den Bleek (Delft University of Technology) gave more examples on a chaotic approach to regime characterization in multiphase flows. He showed that the Kolmogorov entropy, being characteristic for the systems' dynamics and a measure for the degree of unpredictability of the system, can be successfully used as a tool to characterize the flow regimes in many gas/solid fluidized bed reactors and gas/liquid bubble column applications. The degree of unpredictability as measured by the Kolmogorov entropy is such a sensitive tool that it can be used as a base for the development of an early warning system for the detection of bed agglomeration or the timing of grade changes.

Perhaps one of the greatest benefits of the symposium was that it brought together scientists and engineers from different areas of research and applications as well as from different countries. Chemical and process engineers exchanged ideas concerning flow patterns and phase-interface phenomena with scientists and engineers working in power engineering, offshore technology, internal combustion engines, and air-conditioning. Thus, a very valuable and stimulating "cross flow" of ideas was created, leading to a cumulative effect on the exchange of knowledge, know-how, and experience.

Full papers were published in the ASME Heat Transfer Division 1998 Proceedings, HTD- Vol.361-5, American Society of Mechanical Engineers, Three Park Avenue, New York, N.Y.10016, <http://www.asme.org>. The breadth of papers collected in this volume clearly reflects the technological significance and current interest in this important subject area. Readers will benefit from the state-of-the-art technology described herein. With the advancement in sophisticated diagnostic methods and techniques, many important results and new physical insights have been obtained, as can be seen in this publication. Owing to the complexity of the multiphase flow phenomena, however, much remains to be done.

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**Report on VSJ-SPIE '98 "Optical Technology and Image Processing in Fluid, Thermal and Combustion Flow"**  
**Yokohama Japan, December 6-10, 1998**

by Masanobu Maeda

The 5 days joint conference VSJ-SPIE '98 "Optical Technology and Image Processing in Fluid, Thermal and Combustion Flow" in Yokohama was successfully finished on 11. December 1998. The sessions provided following contents; Combustion, Flow Visualization, Fuel Injection Image processing, Interferometry & Radiation, Laser Velocimetry, LIF, Optical fiber Technique, Optical Sensor, Particle & Droplet Measurement, PIV Applications, PIV Fundamentals, Shock Wave, Speckles, 3-D Image Technique, Thermal Measurement, Xray & Electron-Beam. 116 papers are presented by speakers from 15 countries, 67 Japanese and 49 Oversea. It was us just pity that almost of Russian and Chinese papers were canceled. 10 specially invited lecturers presented attractive investigations. Their titles are: "Recent advances in laserbased Diagnostics for gaseous flow" R. Hanson (Stanford Univ., USA) "LIF applications for practical combustors" Y. Deguchi (Mitsubishi heavy industry, Japan) "Role of flow visualization in the development of Unicorn" W.M.Roquemore (AFRL, USA) "Particle image velocimetry in aerodynamics: Thechnology and application in wind tunnels" J.Kompenhans ( DLR, Germany) "New development in phase Doppler anemometry" C.Tropea (Univ.Darmstadt, Germany) "Laser field Schlieren visuarization from wind tunnels to flight" L.Weinstein (NASA Langley, USA) "Structual studies of combustions by use of laser

aided 2-D flame visualization" T.Takagi (Osaka Univ. Japan) "Thermographic investigation of some surface flow patterns" G.M.Carlomagno (Neaples Univ. Italy) "Realization of high performance LDA-systems using optical amplifiers, high power semiconductor lasers and optical fiber lasers" D.Dopheide (PTB. Germany)

The 200 pages special issue of selected papers version of the conference is to be published from the journal of Visualization this year. The proceedings of the conference is still available by CD-Rom. Who are interested please contact Professor M.Kawahashi, Saitama University, Faculty of Engineering, Fax: +81 48-856-2577 E-mail: mkawa@mech.saitama-u.ac.jp

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Conference Co-Chair: M.Kawahashi, K.Takayama, S.S.Cha., J.D.Trolinger

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**All Correspondence Concerning**

News items of general interest to ICeM members, notice of future meetings and conferences, personal news items, new books, etc. should be addressed to the editor or to regional corresponding members. It will be very helpful if any manuscripts proposed for publication are sent by E-mail or if diskettes are also attached to the manuscripts.

**International Conference on Energy Research and Development ( ICERD )  
Kuwait, November 9-11, 1998**

by R. K. Suri

The first International Conference on Energy Research and Development was held in Kuwait from November 9-11, 1998. The conference was inaugurated by Dr. Abdul Aziz Alghanim, Minister of Education and Higher Education on behalf of His Highness, Shaikh Saad Al-Abdullah Al-Salem Al-Sabah, Crown Prince and Prime Minister. The theme of the conference was "Advances in Energy Research & Development", with special emphasis on emerging energy conversion technologies, conservation and management strategies. The objective was to optimize the utilization of basic energy resources in the major energy consuming sectors in the arid region of the Arabian Peninsula, e.g. the power-water co-generation, air-conditioning and refrigeration systems. The conference provided an opportunity to bring together scientists, technologists and energy planners from different parts of the world to discuss the latest developments in energy conversion, conservation and management. Over 100 high quality papers were presented by international experts from 34 countries on various issues concerned with optimal utilization of energy resources. The conference covered the following areas:

1. Energy Conversion and Management
2. Energy Conversion
3. Co-generation Systems
4. Air-conditioning and Refrigeration Systems
5. Energy Environmental Issues
6. Renewable Energy

The conference was sponsored by Kuwait University, Kuwait Foundation for the Advancement of Sciences, Ministry of Electricity and Water and the Kuwait Institute for Scientific Research. Five international experts delivered the keynote addresses on the topics of direct relevance to the needs of the region. The topics of the keynote addresses were:

Energy Conservation & Thermal Comfort: Opportunities and Limitations

by Prof. Byron W. Jones from Kansas State University, USA

Techno-economics of Water Production in Kuwait  
by Prof. Abbas M. R. Marafie from Kuwait University, Kuwait

Sustainability and Future Energy Development  
by Prof. Naim H. Afgan, Instituto Superior Tecnico, Portugal

Optimization of District Heating and Cooling Systems

by Prof. Donald R. Bahnfleth, Ex- Chairman

ASHRAE, USA

Airconditioning in the Global Marketplace  
by Prof. John W. Mitchell, University of Wisconsin, USA

The conference presentations were discussed with the international experts and the Organizing Committee made the following final recommendations:

1. Continue vigorously the Research & Development activities in the energy conservation to conserve basic energy resources.
2. Encourage research for gradual replacement of the Multistage-Flash desalination with Reverse Osmosis for cost-effective water production, lower pollution and better power factor of power plants.
3. Continue research on utilization of renewable sources of energy as a supplementary sources of energy to cut-down the burden on conventional fuels.
4. Expanding the use of combined gas-steam turbines used in power production, as they have higher efficiency and lower pollution effect compared to conventional plants.
5. Conserve the available energy by increasing power stations efficiency and reduction in losses.
6. Implement the concept of District Cooling systems for cooling of residential, institutional and commercial building complexes to save peak power demand.
7. Enhance public awareness to encourage ways and means to conserve power and water.
8. Work on finding new comfort levels for the region since available studies do not consider gulf area weather conditions.
9. Participate in international effort to develop fuel cell technology likely to become commercial in the beginning of next century.
10. Organize regular international conference every three years in the region in order to keep abreast with the newer developments in the use of new and renewable sources of energy and in better energy conversion technologies.

If you need any further details, please contact the undersigned.

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## Future Meetings

Listings include Conference Name, Place, Date and Contact.

**9<sup>th</sup> Workshop on Two-Phase Flow Predictions**  
Helle(Saale), Germany, April 13-16,1999  
Prof. M. Sommerfeld, Martin-Luther-Universitat  
Halle Wittenberg Fachbereich Verfahrenstechnik  
D-06099Halle, Germany  
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### **Seventh European Congress on Fluid Machinery for the oil, Petrochemical and Related Industries**

The Hague, The Netherlands, April 15-16,1999  
Dr. Jim Glasgow(Chairman), Stephanie Love  
C556, Conference and Events Department, Institution of Mechanical Engineers, 1 Birdcage Walk, London SW1H 9JJ  
Tel: +44-171-973-1258, Fax: +44-171-222-9881

### **ICHMT PLASMA-99, 2<sup>nd</sup> International Symposium on Heat and Mass Transfer under Plasma Conditions**

Antalya, TURKEY, April 19-23, 1999  
Prof. Dr. Pierre FAUCHAIS, Faculte des Sciences  
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Tel: +90-312-210 5214, Fax: +90-312-210 1331  
Email: arinc@metu.edu.tr  
www: <http://ichmt.me.metu.edu.tr>

### **ICONE-7, The Seventh International Conference on Nuclear Engineering**

Tokyo, Japan, April 19-23, 1999  
Hajime Akimoto, ICONE-7 Assistant Technical  
Chair Japan Atomic Energy Research Institute-2-  
4, Shirakata Shirane, Tokai-mura, Naka-gun,  
Ibaraki, Japan 319-1195  
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### **9<sup>th</sup> International Conference CMEM 99 -Computational Methods and Experimental Measurement-**

Sorrento, ITALY, April 27-29, 1999  
Prof. G. M. Carlomagno, University of Naples,  
Piazzale Tecchio 80125 Naples, ITALY  
Prof. C. A. Brebbia, Wessex Institute of Technology,  
Ashurst Lodge, Ashurst Southampton,  
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1703-293223, Fax::+44-1703-292853,  
Email: sradford@wessex.ac.uk

### **Second Asia-Pacific Conference on Combustion, National Cheng Kung University**

Taiwan, May 9-12, 1999  
Prof. H.H. Chiu, Fax: 886-6-2389940  
E-mail: hhchiu@htindl.iaa.ncku.edu.tw

### **Fluid Particle Interactions V**

Santa Fe, New Mexico, May 9-14, 1999  
Prof. John G. Yates, Department of Chemical  
Engineering University College London  
Torrington Place, London WC1 E7JE, UK  
Tel: 171-419-3837, Fax: 171-383-2348  
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Avenue Palo Alto, CA 94304, USA  
Tel: 415-855-2438, Fax: 415-855-2287  
E-mail: jmaulbet@msm.epri.com

### **PSFVIP-2, The 2<sup>nd</sup> Pacific Symposium on Flow Visualization and Image Processing**

Honolulu, Hawaii, May 16-19, 1999  
Prof. S. Mochizuki, Dept. of Mechanical Systems  
Engineering Tokyo University of A & T, Nakacho,  
Koganei, Tokyo 184-8588, JAPAN  
Tel/Fax: +81-423-88-7088  
E-mail: psfvip-2@mmlab.mech.tuat.ac.jp  
www: <http://www.cc.tuat.ac.jp/~psfvip-2>

### **2<sup>nd</sup> International Symposium on Two-Phase Flow Modelling and Experimentation**

Pisa, ITALY, May 23-26, 1999  
Dr. G. P. Celata, Heat Transfer Unit Head, Via  
Anguillarese, 301 1-00060 S.M. di Galeria,  
Rome, Italy  
Tel: +39-6-3048-3905, Fax: +39-6-3048-3026  
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www: <http://docenti.ing.unipi.it/~d6600/pisa99/>

### **4<sup>th</sup> International Symposium on Engineering Turbulence Modelling and Measurements**

Corsica, France, May 24-26, 1999  
Prof. W. Rodi, Institut für Hyromechanik,  
Universität Karlsruhe, Kaiserstraße 12, D-76128  
Karlsruhe, Germany, Tel:+49-721-608-3535,  
Fax:+49-721-608-2202/4260  
E-mail: etmm4@ifh.bau-verm.uni-karlsruhe.de  
www: <http://www.ifh.verm.uni-karlsruhe.de/etmm4>

### **Second International Conference and Exhibition on ENVIRONMENTAL ENGINEERING**

Veszprem, Hungary, May 29-June 5, 1999  
School of Environmental Engineering, University



of Veszprem 8200 Veszprem Egyetem u. 10, Hungary, Tel/Fax:+36-88-425-049  
E-mail: envconf@almos.vein.hu, <http://www.vein.hu/academic>

**TEMPMEKO '99 (7th International Symposium on Temperature and Thermal Measurements in Industry and Science)**  
Delft, THE NETHERLANDS, June 1-3, 1999  
Dr. P. Bloembergen, Fax: +31 15 2612 971  
E-mail: tempmeko@nmi.nl

**The 5<sup>th</sup> International Union of Materials Societies' (IUMRS). International Conference on Advanced Materials**  
Symposium Z: Materials Research and Thermophysics in Extreme Cases  
Beijing, CHINA, June 13-18, 1999  
Prof. Z.Y. Guo, Fax: +86 10 6278 1610,  
E-mail: demgzy@mail.tsinghua.edu.cn

**9<sup>th</sup> International Conference multiphase 99 Frontier Technology Comes of Age**  
Cannes, France, June 16-18, 1999  
Mrs. Chtherine Cox, BHR Group Limited, Cranfield, Bedfordshire MK43 OAJ, UK  
Tel:+44-1234-750422, Fax:+44-1234-750074,  
E-mail:ccox@bhrgroup.co.uk

**17<sup>th</sup> UIT National Heat Transfer Conference**  
Ferrara, ITALY, June 16-18, 1999  
Prof. S. Piva, Fax: +39 0532 768 602  
E-mail: uit99@ing.unife.it

**The Combustion Institute and ICHMT MCS-99, -Mediterranean Combustion Symposium-**  
Antalya, TURKEY, June 19-23, 1999  
Prof.Dr.Faruk Arinc, ICHMT Secretary General  
Mechanical Engineering Department Middle East  
Technical University 06531 Ankara, TURKEY  
Tel:+90-312-210 5214/1429, Fax:+90-312-210  
1331/1266, E-mail: arinc@metu.edu.tr  
www: <http://ichmt.me.metu.edu.tr/upcoming-meetings/MCS-99/announce.html>

**The Second International Conference on PNEUMATIC AND HYDRAULIC CONVEYING SYSTEMS**  
Davos, SWITZERLAND, June 20-25, 1999  
Engineering Foundation, 345 East 47th Street,  
New York, NY 10017, USA  
Tel:+1-212-705-7836, Fax:+1-212-705-7441  
E-mail: engfnd@aol.com, <http://www/engfnd.org>

**7<sup>th</sup> International Symposium on Gas-Liquid Two-Phase Flows**, 1999 ASME FED Summer Meeting  
San Francisco, USA, June 22-26, 1999  
Dr. Upendra S. Rohatgi, Brookhaven National Lab., Dept. of Nuclear Energy, Upton, NY 11973, USA, Tel: +1-516-282-2475

Fax: +1-516-282-2613, E-mail: rohatgi@bnl.gov

**First Symposium on Energy and Its Environmental Impact**  
June 1999, Zagazig University, Zagazig, Egypt  
Prof. Ahmed F.El-Sayed, Zagazig Univ.11  
Tohama Street,7th District,Nasr City,Cairo  
11471,Egypt. Tel. +20-202-4016598  
E-mail: AFAYEZ@FRCU.EUN.EG

**4<sup>th</sup> Liquid Matter Conference**  
Granada, Spain, July 3-7, 1999  
Prof. Pedro Tarazona, Departamento de Física Teórica de la Materia Condensada Universidad Autónoma de Madrid E-28049 MADRID, SPAIN  
Tel:++34-91-3974950, FAX:++34-91-3974907  
E-mail: pedro@fluid5.fmc.uam.es  
Prof. Dr. Roque Hidalgo-Avarez, Departamento de Física Aplicada Universidad de Granada Campus de Fuentenueva E-18071 GRANADA SPAIN, Tel.:++ 34 - 958 - 24 32 13, FAX:++ 34 - 958 - 24 32 14, e-mail:liquid99@ugr.es  
www: <http://www.ugr.es/~liquid99/>

**Fifth International Conference on TECHNOLOGIES AND COMBUSTION FOR A CLEAN ENVIRONMENT**  
Lisbon, Portugal, July 12-15, 1999  
Prof. M. G. Carvalho, Technical University of Lisbon Portugal  
Tel: +351-1-8417378, Fax: +351-1-8475545  
E-mail: cleanair@esoterica.pt,  
maria@navier.ist.utl.pt, www: <http://navier.ist.utl.pt/cleanair/>

**Compact Heat Exchangers and Enhancement Technology for the Process Industries**  
Banff, CANADA, July 18-23, 1999  
Dr. R. Shah, Fax: +1 716 439 3168, E-mail: rkshah@ibm.net

**8<sup>th</sup> International Symposium on Gas-Particle Flows, ASME-JSME Fluids Engineering Conference**  
San Francisco, USA, July 18-23, 1999  
Prof. David E. Stock, Dept. of Mech. & Matls. Engrg., Washington State Univ., Pullman, WA 99164-2920, USA  
Tel: +1-509-335-3223, Fax: +1-509-335-4662  
E-mail: stock@mme.wsu.edu

**3<sup>rd</sup> ASME/JSME Fluids Engineering Conference**  
San Francisco, USA, July 18-23,1999  
ASME: Prof.M. Volkan Otugen  
Tel: 561-755-4385, Fax: 516-755-4526  
E-mail: votugen@rama.poly.edu  
JSME: Prof.Shigeaki Masuda  
Tel:+81-45-563-1141, Fax:+81-45-563-5943  
E-mail: smasuda@mech.keio.ac.jp

**IJPGC-International Conference on Power Engineering-99 (IJPGC-ICOPE-99)**

San Francisco, July 25-28,1999  
ASME: Mr. William C. Stenzal  
Tel:+1-312-269-6520, Fax:+1-312-269-6122  
E-mail: wstenzel@sepril.com  
JSME: Dr. Mikio Sato  
Tel:+81-468-56-2121, Fax:+81-468-57-5829,  
E-mail: satomiki@criepi.denken.or.jp  
CSPE: Dr.Kefa Cen,  
Tel:+86-571-795-1335,795-1153  
Fax:+86-571-795-1616,795-1358  
E-mail: kfcen@sun.zju.edu.cn

**First Asia Aerosol Conference**

Nagoya, Japan, July 27-29, 1999  
Conference Secretariat, Solar-Terrestrial Environment Laboratory, Nagoya University, Chikusa-ku, Nagoya 464-8601, Japan  
Tel:+81-52-789-4300, Fax:+81-52-789-4301,  
E-mail:kgotoh@stelab.nagoya-u.ac.jp

**2<sup>nd</sup> International Symposium on Computational Technologies for Fluid/Thermal/Chemical Systems with Industrial Applications (ASME PVP Division Conference)**

Boston, Massachusetts, USA August 1-5, 1999  
Dr. Vladimir Kudriavtsev for USA and Canada, Watkins-Johnson Company Scotts Valley, CA 95066, USA, Tel:+1-408-439-4553  
FAX:+1-408-243-4220  
E-mail: vladimir.kudriavtsev@wj.com.vvk0  
Dr. Satoyuki Kawano for Japan and Pacific Rim, Institute of Fluid Science Tohoku University 2-1-1 Katahira, Aobaku, Sendai 980-8577, JAPAN  
Tel:+81-22-217-5265, Fax:+81-22-217-5311  
E-mail: kawano@ifs.tohoku.ac.jp  
Dr. Chris R. Kleijn for Europe and rest of the world, Delft University of Technology Kramers Laboratorium voor Fysische Technologie Prins Bernhardlaan 6 2628 BW Delft THE NETHERLANDS, Tel:+31-15-278-2835, Fax:+31-15-278-2838, E-mail: crkleijn@klft.tn.tudelft.nl  
Symposium Web-site: <http://www.netcom.com/~vvk>

**International Conference on Enhancement and Promotion of Computational Methods in Engineering and Science**

MACAO, August 2-5 ,1999  
Prof. Joao Bento / Prof.Eduardo Pereira  
E-mail: epmese@civil.ist.utl.pt

**33<sup>rd</sup> National Heat Transfer Conference EXPERIMENTAL STUDY OF MULTIPHASE FLOW**

New Mexico, August 15-17,1999  
Dr. Jovica R. Riznic, Atomic Energy Control Board Research and Support Section 280 Slater, P.O.B 1046, Station B, Ottawa, CANADA KIP 5S9, Tel: +1-613-943-0132, Fax: +1-613-943-

8954, E-mail: riznic.j@atomcon.gc.ca

**MINERALS BIOPROCESSING IV**

Stockholm, Sweden, August 15-20, 1999  
Prof. K.S.E. Forsberg,  
Tel: +46-920-91311, Fax: +46-920-97364  
E-mail: Eric.Forsberg@km.luth.se  
Dr. K.Hanumantha Rao,  
Tel: 46-920-91705, Fax: 46-920-97364  
E-mail: Hanumantha.Rao@km.luth.se

**SMiRT-15, 15<sup>th</sup> International Conference on Structural Mechanics in Reactor Technology**

Seoul, KOREA, August 15-20, 1999  
Prof. S.P. Chang, Fax: +82 2 885 0554  
E-mail: smirt@plaza.snu.ac.kr

**First International Conference on Engineering Thermophysics (Thermal Science including thermodynamics, fluid flow, heat and mass transfer, combustion, multiphase flow)**

Beijing, China, August 18-21, 1999  
Prof. Jianzhong Xu , Fax: 86-10-62555581  
E-mail:xjz@etpserver.etp.ac.cn

**Fourth International Symposium on Coal Combustion**

Beijing, China, August 18-21, 1999  
Prof. Xuchang Xu, Fax: 86-10-62770209  
E-mail: xxc-dte@mail.tsinghua.edu.cn  
Prof. Lixing Zhou, Fax: 86-10-62785569,  
E-mail: zhoulx@mail.tsinghua.edu.cn

**4th International Conference on Gas-Liquid Engi and Gas-Solid Reactor Engineering**

Delft, THE NETHERLANDS, August 22-25, 1999  
GLS'99 c/o R. Peys, Fax: +32 3 216 0689  
E-mail: gas@conferences.ti.kviv.be

**6<sup>th</sup> International Conference on Circulating Fluidized Beds Dechema E.V.**

Wüzburg, Germany, August 22-27, 1999  
DECHEMA e.V., Cpmgress Office, Attn.: Christiane Mitter, P.O.B. 15. 01 04, D-60061 Frankfurt am Main,  
Tel: +49-69-7564-280, Fax: +49-69-7564-304  
E-mail: nick@dechema.de  
www: <http://dechema.de/cfb-6>  
Prof.Dr. Ulrich Mueller, Forschungszentrum Karlsruhe GmbH Institut fuer Angewandte Thermo-und Fluidodynamik Postfach 36 40 76021 Karlsruhe GERMANY  
Tel:(07247)82 3450, Fax:(07247)82 4837  
E-mail:ulrich.mueller@iatf.fzk.de or, secretary@iatf.fzk.de

**Environmental Technology for Oil Pollution**

Jurata, Poland, August 29-September3,1999  
Co-Chair, Dr. Jan Hupka,  
E-mail: jhupka@chem.pg.gda.pl

Co-Chair, Dr. Jan D. Miller  
E-mail: jdmiller@mines.utah.edu  
Engineering Foundation Conferences, Three Park  
Avenue, New York, NY 10016-5902  
Tel: +1-212-591-7836, Fax: +1-212-591-7441  
E-mail: engfnd@aol.com, www.engfnd.org

**15<sup>th</sup> European Conference on Thermophysical Properties**

Wurzburg, GERMANY, September 5-9, 1999  
Prof. J. Fricke, Fax: +49 931 705 6460  
E-mail: ectp@zae.uni-wuerzburg.de

**Single-Phase and Two-Phase Natural Circulation - EURO THERM Seminar 63**

Genova, ITALY, September 6-8, 1999  
Prof. M. Misale, Tel.: +39 10 353 2576, Fax: +39  
10 311 870, E-mail: misale@ditec.unige.it  
www: <http://www.werg.casaccia.enea.it/eurotherm/frame.html>

**15<sup>th</sup> European Conference on Thermophysical Properties**

Wurzburg, GERMANY, September 5-9, 1999  
Prof. J. Fricke, Fax: +49 931 705 6460  
E-mail: ectp@zae.uni-wuerzburg.de

**14<sup>th</sup> International Conference Slurry Handling and Pipeline Transport, Hydrotransport 14**

Maastricht, The Netherlands, September 8-10, 1999  
Mrs. Chatherine Cox, BHR Group Limited,  
Cranfield, Bedfordshire MK43 0AJ, UK  
Tel: +44-1234-750422, Fax: +44-1234-750074  
E-mail: ccox@bhrgroup.co.uk

**1<sup>st</sup> International Symposium on Turbulence and Shear Flow Phenomena**

Santa Barbara, CA, USA, September 12-15, 1999  
Prof. Nobuhide Kasagi, Chair of Organizing Committee,  
The University of Tokyo, Department of Mechanical Engineering,  
Hongo 7-3-1, Bunkyo-ku, Tokyo 113-8656, JAPAN  
Tel: +81-3-3812-2111/6417, Fax: +81-3-5800-6999,  
E-mail: kasagi@thtlab.t.u-tokyo.ac.jp,  
www: <http://www.thtlab.t.u-tokyo.ac.jp>

**TURBULENCE AND SHEAR FLOW PHENOMENA FIRST INTERNATIONAL SYMPOSIUM**

Santa Barbara, CA, USA, September 12-15, 1999  
Prof. Sanjoy Banerjee, Department of Chemical Engineering  
University of California, Santa Barbara, CA 93106-5080, USA  
Tel: +1-805-893-3456, Fax: +1-805-893-4731  
E-mail: tsfp@engineering.ucsb.edu  
<http://tsfp.t.u-tokyo.ac.jp>

**International Conference on Compressors and their Systems**

London, UK, September 13-15, 1999

Fax: +44 171 222 9881

**54<sup>th</sup> ATI National Conference**

L'Aquila, ITALY, September 14-17, 1999  
Secretariat, Fax: +39 0862 434303  
E-mail: ati99@ing.univaq.it

**6<sup>th</sup> UK National Conference on Heat Transfer**

Edinburgh, UK  
15-16 September 1999  
S. Love, Fax: +44 171 222 9881  
E-mail: s\_love@imeche.org.uk

**3<sup>rd</sup> International Workshop on Particle Image Velocimetry**

Santa Barbara, CA, USA, September 16-18, 1999  
Prof. R. Adrian (Chair), Prof. Carl D. Meinhart (S.G.),  
Mechanical and Environmental Engineering Department,  
University of California- Santa Barbara, Santa Barbara,  
California 93106  
Tel: +1-805-893-4563, Fax: +1-805-893-8651  
E-mail: piv99@engineering.ucsb.edu  
<http://www.engineering.ucsb.edu>

**20<sup>th</sup> International Congress of Refrigeration**

Sydney, AUSTRALIA, September 19-23, 1999  
ICR99 Secretariat, Fax: +61 3 9328 4116  
E-mail: icr99@airah.org.au

**Control of Particulate Processes VI**

Queensland, Australia, September 19-24, 1999  
Prof. Jim Litster, Department of Chemical Engineering,  
The University of Queensland, QLD 4072 Australia,  
Tel: +61-7-3365-3777, Fax: +61-7-3365-4199,  
E-mail: j.litster@cheque.uq.edu.au

**Engineering Foundation Conference on Microgravity Fluid Physics and Heat Transfer**

Kailua-Kona, HI, USA, September 19-24, 1999  
Prof. V.K. Dhir, Fax: +1 310 206 4830; E-mail: vdhir@seas.ucla.edu

**4<sup>th</sup> International Congress on Energy, Environment and Technological Innovation**

Rome, ITALY, September 20-24, 1999  
EETI99, Fax: +39 06 488 3235; E-mail: eeti99@minerva.ing.uniroma1.it

**3<sup>rd</sup> Baltic Heat Transfer Conference**

Gdansk, POLAND, September 22-24, 1999  
Prof. B.J. Grochat, Fax: +48 58 341 6144  
E-mail: wojtek@imppan.imp.pg.gda.pl

**13<sup>th</sup> International Conference on PIPELINE PROTECTION**

Edinburgh, Scotland, September 29-October 1, 1999  
Mrs. Tracey Wheeler, BHR Group Limited,  
Cranfield, Bedfordshire MK43 0AJ, UK  
Fax: +44-(0)1234-750074

E-mail: [twheeler@bhrgroup.co.uk](mailto:twheeler@bhrgroup.co.uk)

**NURETH-9, Ninth International Topical Meeting on Nuclear Reactor Thermal Hydraulics**

San Francisco, CA, USA, October 3-8, 1999  
Virgil E. Schrock, Tech.Prog.Chair, Department of Nuclear Engineering, University of California, Berkeley, CA 94720-1730  
Tel: +1-510-642-6431, Fax: +1-510-643-9685  
E-mail: [schrock@nuc.berkeley.edu](mailto:schrock@nuc.berkeley.edu)  
www: <http://www.nuc.berkeley.edu/NURETH9/NURETH9.html>

**Chemical and Reaction engineering VII: Computational fluid Dynamics**

Barga, Italy, October 10-15, 1999  
Engineering Foundation Conferences, Three Park Avenue, New York, NY 10016-5902,  
Tel:+1-212-591-7836, Fax:+1-212-591-7441,  
E-mail:[engfnd@aol.com](mailto:engfnd@aol.com), [www.engfnd.org](http://www.engfnd.org)

**26<sup>th</sup> International Electric Propulsion Conference**

Kitakyushu, Japan, October 17-21, 1999  
Prof. Yoshihiro Arakawa, Dept. Aeronautics & Astronautics, University of Tokyo, 7-3-1 Hongo, Bunkyo-Ku, Tokyo 113-8656, Japan  
Tel:+81-3-3812-2111 ext.6629, Fax:+81-3-3818-7493, E-mail:[arakawa@al.t.u-tokyo.ac.jp](mailto:arakawa@al.t.u-tokyo.ac.jp)

**The 3<sup>rd</sup> International Conference on Material Handling & International Conference on Freight Pipeline**

Shanghai, China, October 19-23, 1999  
Prof. Wang Ruigang, Chinese Mechanical Engineering Society, 46 Sanlihe Road, Beijing 100823, China, Tel:+86-10-6859-5318, Fax:+86-10-6859-5314, E-mail:[cmesgzzb@public.fhnet.cn.net](mailto:cmesgzzb@public.fhnet.cn.net)

**Asian Symposium on Multiphase Flow (ASMF'99)**

Osaka, Japan, October 31-November 3, 1999  
Prof. K.Ohba, Kansai University, Dept. of Mechanical Engineering 3-3-35 Yamate, Suita, Osaka 564-8680, Japan  
Tel: +81-6-6368-0817, Fax:+81-6-6388-9927  
E-Mail: [ohbak@ipcku.kansai-u.ac.jp](mailto:ohbak@ipcku.kansai-u.ac.jp)

**1999 ASME International Mechanical Engineering Congress and Exhibit**

Nashville, TN, USA, November 14-19, 1999  
Dr. L.C. Witte; E-mail: [imece99@uh.edu](mailto:imece99@uh.edu)  
7th Symposium on Multiphase Transport in Porous Media  
Dr. M.J. Martinez, Fax: +1 505 844 452  
E-mail: [mjmarti@engsci.sandia.gov](mailto:mjmarti@engsci.sandia.gov)  
Fundamental Heat Transfer Issues in Direct Energy Conversion  
Prof. Gang Chen, Fax: +1 310 206 521  
E-mail: [gchen@seas.ucla.edu](mailto:gchen@seas.ucla.edu)

Supercritical System Thermal Hydraulics  
Dr. S.Y. Lee, Fax: +82 42 869 5210  
E-mail: [e\\_hyunny@cais.kaist.ac.kr](mailto:e_hyunny@cais.kaist.ac.kr)

**4<sup>th</sup> Maghrebine Conference on Studies in Mechanical Engineering (MCSME'99)**

Constantine, ALGERIA, November 28-30, 1999  
Secretariat, Tel.: +213 4 92 31 00, Fax: +213 4 92 31 00, E-mail: [jegm.cirta@caramail.com](mailto:jegm.cirta@caramail.com)

**15th National Heat and Mass Transfer Conference and 4th ISHMT/ASME Heat and Mass Transfer Conference**

Girinagar, PUNE, INDIA, January 5-8, 2000  
Prof. S.P. Venkateshan, Fax: +91 44 235 0509  
E-mail: [spv35@hotmail.com](mailto:spv35@hotmail.com)  
Dr. V. Prasad, Fax: +1 516 632 8339  
E-mail: [prasad@pml.eng.sunysb.edu](mailto:prasad@pml.eng.sunysb.edu)

**Symposium on Energy Engineering in the 21st Century**

Hong Kong, January 9-13, 2000  
Prof. Ping Cheng, Fax: +852 2358 154  
E-mail: [mepcheng@ust.hk](mailto:mepcheng@ust.hk)

**Population Balance Modeling of Particulate Systems**

Kona, HI, January 23-28, 2000  
Dr. John A. Herbst  
J. A. Herbst & Associates, PO Box 2568, 79-7460 Mamalahoa, Hwy, Mango Court, Bldg. 2, Suite 215 Kealahou, HI 96750-2568 USA  
Tel:+808-324-6100, Fax:+808-324-6304  
E-mail:[john.herbst@jan-net.com](mailto:john.herbst@jan-net.com)

**4<sup>th</sup> International Boiling Conference**

Anchorage, ALASKA, USA, April 30 - May 5, 2000  
Prof. A. Bar-Cohen, Fax: +1 612 624 1398  
E-mail: [abc@cdtl.umn.edu](mailto:abc@cdtl.umn.edu)  
Dr. G.P. Celata, Fax: +39-6-3048-3026  
E-mail: [celata@casaccia.enea.it](mailto:celata@casaccia.enea.it)

**Renewable Technologies for Sustainable Development**

Madeira, PORTUGAL, June 2000  
Prof. M.G. Carvalho, Fax: +351 1 847 5545/726 2633; E-mail: [maria@navier.ist.utl.pt](mailto:maria@navier.ist.utl.pt)

**The Third Israeli Conference for Conveying and Handling of Particulate Solids Joined with the Tenth International Freight Pipeline Society Symposium**

The Dead Sea, Israel, May 29- June, 2000  
(Abstract due: August 1, 1999)  
Dr. Haim Kalman, Department of Mechanical Engineering, Ben-Gurion University of the Negev, P.O.Box 653, Beer-Sheva, 84105, Israel  
Tel:+972-7-6477099, Fax:+972-7-6472813  
E-mail:[kalman@menix.bgu.ac.il](mailto:kalman@menix.bgu.ac.il)

**Integral Methods in Science and Engineering 2000**

Alberta, CANADA, June 12-15, 2000  
Dr. P. Schiavone, Department of Mechanical Engineering, University of Alberta, 4-9 Mechanical Engineering Building, Edmonton, ALBERTA, T6G 2G8, CANADA  
Tel: +403-492-3638, Fax: +403-492-2200  
E-mail: Peter.Schiavone@ualberta.ca

**Tenth International Symposium on Applications of Laser Techniques to Fluid Mechanics**

Lisbon, Portugal, July 10-13, 2000  
(Abstract due: December 17, 1999)  
Prof. M. V. Heitor, Dept. of Mechanical Engineering, Institute Superior Tecnico, Av. Povisco Pais, 1049-001 Lisbon, Portugal  
Tel: +351-1-8417379 Fax: +351-1-8496156  
E-mail:llaser@in3.dem.ist.utl.pt

**9<sup>th</sup> International Symposium on Flow Visualization**

Edinburgh, Scotland, UK, August 22-25, 2000  
(Abstract due: December 12, 1999)  
Prof. I. Grant, Heriot-Watt University, Edinburgh, Scotland, EH105PJ, UK  
Tel: +44-1314478800 Fax: +44-1314478660  
E-mail:9misfv@ode-web.demon.co.uk  
<http://www.ode-web.demon.co.uk/9misfv/>  
<http://www.ode-web.demon.co.uk/post-conf-web/flyer.html>

**20<sup>th</sup> International Congress of Theoretical and Applied Mechanics**

Chicago, IL, USA, August 27-September 2, 2000  
(Abstract and Extended Summary due: January 17, 2000)

Prof. James W. Phillips, Secretary-General, ICTAM 2000, Department of Theoretical and Applied Mechanics, University of Illinois at Urbana-Champaign, 216 Talbot Laboratory, 104 South Wright Street, Urbana, IL 61801-2983, USA, Tel: +1-217-333-4388 Fax: +1-217-244-5707, E-mail:ictam2000@tam.uiuc.edu, <http://www.tam.uiuc.edu/ICTAM2000>

**3<sup>rd</sup> European Thermal Sciences Conference**

Heidelberg, GERMANY, September 10-13, 2000  
Prof. E. Hahne, Fax: +49 711 685 3503  
E-mail: pm@itw.uni-stuttgart.de  
www: <http://www.werg.casaccia.enea.it/eurotherm/frame.html>

**4<sup>th</sup> ICMF 2001-New Orleans**

New Orleans, Louisiana, USA, May 27-June 1, 2001  
Prof. E. Michaelides  
School of Engineering, Tulane University  
New Orleans LA 70118, USA  
Tel: +1-504-865-5764, Fax: +1-504-862-8747  
E-mail: emichael@mailhost.tcs.tulane.edu  
home page: <http://www.tulane.edu/~engradiv/emichael/index.html>

**5<sup>th</sup> World Conference on Experimental Heat Transfer, Fluid Mechanics and Thermodynamics**

Thessaloniki, GREECE, September 24-28, 2001  
Dr. G.P. Celata  
Tel.: +39-6-3048-3905, Fax: + 39-6-3048-3026  
E-mail: celata@casaccia.enea.it  
Dr. P. Di Marco  
Tel.: +39-50-569-610, Fax: +39-50-569-666  
E-mail: p.dimarco@ing.unipi.it

Information on the Japan Society of Multiphase Flow (JSMF) and on the International Information Center for Multiphase Flow (ICeM) available on:

JSMF: <http://www.ijnet.or.jp/JSMF>

ICeM: <http://www.kz.tsukuba.ac.jp/~monji/> (tentative)

Information on the International Center for Heat and Mass Transfer (ICHMT) and on ICHMT conferences available on:

<http://ichmt.me.metu.edu.tr>

Information on the EURO THERM COMMITTEE available on:

<http://www.werg.casaccia.enea.it/eurotherm/>

## Corresponding Members

### CANADA

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Dept. of Chemical Engineering & Applied Chemistry  
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E-MAIL: kawaji@ecf.toronto.edu

**Prof. S.B.Savage**  
McGill University  
Dept. of Civil Engineering & Applied Mechanics  
817 Sherbrooke Street West Montreal,  
Quebec H3A 2K6, Canada  
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### FRANCE

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### A Note from the Editor

Members, who have paid the membership fee but did not send their Biographical Questionnaire, please send the Questionnaire to the Editor as soon as possible.

Members, who have sent the Biographical Questionnaire but did not pay the membership fee, should pay the fee to ICeM.

The annual membership fee is ¥3,500 (Japanese yen) (¥1,500 for members of the Japan Society of Multiphase Flow (JSMF) )

Please send your remittance to the Editor in one of the following ways.

- 1) International Postal Remittance Service
- 2) Postal Giro Account

Account Number: 00370-2-17483

Name of the Account: ICeM

- 3) Citi Bank Account

Ohtemachi Branch, Tokyo, Japan

MultiMoney Account Number: 92095054

Name of the Account: Mr. Goichi Matsui I / F / O ICeM

(Personal checks payable to Mr. Goichi Matsui I / F / O ICeM at Citi Bank are acceptable, but that depends.)

\*Personal checks are usually not acceptable in Japan.

- ICeM will send the membership card and the receipt of membership fee for those who pay the fee.
- The ICeM Newsletter is published twice a year and the next issue will be published in October 1999.
- Space may be bought in the Newsletter for advertisements. Please contact the Editor for details and rates.
- Any questions/comments are also welcome.





### **The Third Israeli Conference for Conveying and Handling of Particulate Solids**

The objectives of the Conference are to bring together researchers, engineers and industrialists, from Israel and abroad, who are active in the areas of conveying and handling of particulate solids, to report on recent developments and exchange experiences and insights. The Conference will consist of many plenary and keynote lectures on emerging technologies, as well as contributed papers. The scope of the Conference covers all the topics in particle technology as appears at the preliminary indication of interest form.

In order to stimulate discussions, contributed papers will be presented in oral or poster sessions. All papers will be published in the Conference proceedings (no copy-rights are requested), and selected papers will be published in a reviewed book.

The official language of the Conference is English.

The Conference will be accompanied by a commercial exhibition.

Sightseeing tours in the Dead Sea area and elsewhere in Israel (including Jerusalem) will be available before, during (for accompanying persons) and after the Conference.

Each day of Conference will include two coffee breaks, lunch and reception.

More (and updated) information can be found on: <http://www.bgu.ac.il/me/bsh>

### **Schedule**

*August 1, 1999*

Two copies of an abstract typed in English (up to 500 words) should be submitted to the Conference Chairman. The abstract should include: name(s) of author(s), affiliation(s), address of the contact person, phone and fax number, e-mail address, and indication of at least one topic from the "Scope of the Conference".

*October 15, 1999*

Authors will be notified of papers acceptance. Instructions for writing the full length papers will be sent to the authors.

*February 1, 2000*

Full length manuscripts need to be received by the Conference Chairman.

*May 29, 2000*

Opening of the Conference.

#### **Conference Chairman**

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# 10th ICFM 2000

## Call for papers

Tenth international symposium on applications of laser techniques to fluid mechanics At The Calouste Gulbenkian Foundation Lisbon, Portugal 10-13 July, 2000 <http://in3.dem.ist.utl.pt/lisba-laser>

## Background

The Symposium will present new research on advanced techniques for flow measurement and results of significance to fluid mechanics. It will emphasize the application of laser, and other advanced techniques, to scientific and engineering investigations of fluid flow. Contributions to the theories and practice of measurement methods will be accepted where they facilitate new improved fluid mechanical investigations, and may include laser-Doppler velocimetry, particle image velocimetry, PIV, and laser induced fluorescence and other scaler diagnostics. Non-optical techniques that provide new and reliable information on fluid flows heat and mass transfer and complement that obtained with laser diagnostics are also welcome for the 10th Symposium.

## Sessions

Approximately forty formal sessions are planned and contributed papers are welcome in the following areas:

- LDV signal and data processing
- Two-phase flows instrumentation
- Multi-point Methods
- Holographic PIV
- PIV signal and data processing
- Scaler diagnostics
- Aerodynamic flows
- Biological and complex flows
- Combustion and advanced combustor concepts
- Engines
- Turbomachinery
- Two-phase flows
- Vortices
- Wall flows

## Invited Plenary Lectures:

- Dr. H. MacDonald, Director, NASA Ames Research Center, USA
  - Wind tunnels and flight
- Prof. R. Bilger, University of Sydney, Australia
  - Combustion models and practice
- Prof. G. Leal, University of California at Santa Barbara, U.S.A.

Reological fluids and their use in industry  
Prof. M. Kiya, Hokkaido University, Japan

Challenging issues in separated and complex turbulent flows

A further keynote lecture will be delivered by Prof. F. Durst, University of Erlangen, Germany, on the development of optical methods for fluid mechanics

## Proceedings:

All papers accepted for presentation will be incorporated in a Proceedings Volume which will be available at the time of Symposium. The proceedings will be distributed to all the participants, together with a bound volume with selected papers from the 9th International Symposium, which will be published by Springer-Verlag. It is intended that a new bound volume will be published subsequently to the Symposium and will contain extended papers.

Paper selection will be based upon **extended abstracts** of not less than 500 words, which should be typed double space and state the purpose, results and conclusions of the work with supporting figures as appropriate. Four copies of the abstract should be submitted to:

LADOAN-10  
c/o Prof. M.V.Heitor  
Dept. of Mechanical Engineering Instituto Superior Tecnico  
Av. Rovisco Pais 1049-001 Lisboa, Portugal  
Fax:351-849-6156 E-mail [llaser@in3.dem.utl.pt](mailto:llaser@in3.dem.utl.pt)

## Deadlines

- final date for receipt of abstracts  
17. December 1999
- Authors informed concerning acceptance  
10. March 2000
- Final date for receipt camera-ready manuscripts  
31. May 2000

## Organizing Committee

- R.J.Adrian, University of Illinois, USA
- D.F.J.Durao, Instituto Superior Tecnico, Portugal
- M.V.Heitor, Instituto Superior Tecnico, Portugal
- M.Maeda, Keio University, Japan
- C.Tropea, technical; University of Darmstadt, Germany
- J.H.Whitelaw, Imperial College, England

**General Information**

The 20th International Congress of the International Union of Theoretical and Applied Mechanics (IUTAM) will be held from August 27 to September 2, 2000, in Chicago, Illinois, USA. The Congress, ICTAM 2000, was invited by the U.S. National Academy of Sciences upon the recommendation of the U.S. National Committee on Theoretical and Applied Mechanics. A consortium of universities will host the meeting. The venue is the Chicago Marriott Downtown conference hotel. President of ICTAM 2000 is Prof. Hassan Aref of the University of Illinois at Urbana-Champaign.

Correspondence related to scientific matters should be sent to:

**Prof. James W. Phillips**  
 Secretary-General, ICTAM 2000  
 Dept. of Theoretical and Applied Mechanics  
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 216 Talbot Laboratory, 104 South Wright St.  
 Urbana, IL 61801-2963 USA  
 Phone: +1 217 333 4388  
 Fax: +1 217 244 5707

E-mail: ICTAM2000@tam.uiuc.edu  
 Correspondence related to registration, hotel accommodations, and the accompanying persons program should be sent to:

**Program Director, ICTAM 2000**  
 Division of Conferences and Institutes  
 University of Illinois at Urbana-Champaign  
 202 University Inn, 302 East John St.  
 Champaign, IL 61820-5698 USA  
 Phone: +1 217 333 2860  
 Fax: +1 217 333 9561

E-mail: ICTAM2000@cc3po.uiuc.edu  
 All information on ICTAM 2000, including forms to submit papers and to register, will be available on the Congress World Wide Web site at <http://www.tam.uiuc.edu/ICTAM2000>.

\*Brown University, Cornell University, Illinois Institute of Technology (Iowa), State University, Michigan State University, Ohio State University, University of Chicago, University of Illinois at Chicago, University of Illinois at Urbana-Champaign, University of Michigan, University of Minnesota, University of Notre Dame, University of Wisconsin.

**Publications**

An Abstract Book of all papers to be presented at ICTAM 2000 will be distributed to registered participants at the Congress.

A hard-cover book of Proceedings will be published by Kluwer Academic Publishers after the Congress. It will contain the text of the Opening, Closing, and Sectional Lectures and the Introductory Lectures of the Mini-Symposia, a list of all contributed papers presented at the Congress (but not the abstracts), a list of all participants in ICTAM 2000; and a general report on the Congress.

Authors of contributed papers presented at the Congress are encouraged to submit their work to appropriate journals for publication.

**Support Grants**

ICTAM 2000 will have at its disposal limited funds to provide support for attendees, particularly for younger researchers who may not otherwise be able to attend, and for participants who are unable to secure adequate funds from their home countries. Priority will be given to authors presenting work at the Congress. Prospective participants who wish to apply for financial assistance should request an application form from the Secretary-General, who will provide further instructions.

**Accommodations**

The Chicago Marriott Downtown is the conference hotel and Congress site. A special rate for Congress participants has been negotiated and will be honored through August 4, 2000. Participants should make their own reservations with the hotel. Further details will be provided in the Second Announcement, to be distributed in 1999, and on the Congress website.

**Program for Accompanying Persons**

Chicago is an exciting city with a multitude of recreational possibilities, museums, excellent shopping and restaurants, parks, superb architecture, major sports teams, musical performances, theaters, and shows. A comprehensive program of interest to accompanying persons will be available.

**Call for Papers**

Congress participants are encouraged to contribute a paper. The paper must be in English, and should present material that is novel and preferably unpublished at the time of the Congress. All papers presented at the Congress are by invitation based on the recommendation of the International Papers Committee. No author will be invited to present more than one paper. Prospective authors are asked to submit only one paper for consideration. Submission of a paper for consideration requires two steps:

**1. Submission of a brief Abstract**

Abstracts of all papers invited for presentation will be printed in the Abstract Book. The Abstract is limited to 150 words. It should not contain figures, drawings, or extensive references. It may contain equations in L<sup>A</sup>T<sub>E</sub>X. To assure correct formatting, please submit the Abstract by using the World Wide Web form at the URL

- <http://www.tam.uiuc.edu/ICTAM2000>
- If access to the World Wide Web is not available, please request instructions by sending e-mail to
- [ICTAM2000@tam.uiuc.edu](mailto:ICTAM2000@tam.uiuc.edu)

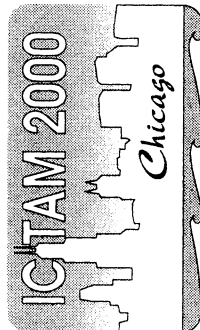
**2. Submission of an Extended Summary**

The Extended Summary will be used for evaluation by the International Papers Committee, but will not be printed. It must have the same title and list of authors as the Abstract. Extended Summaries that do not match up with submitted Abstracts in terms of title or names of authors will not be considered. The Extended Summary is limited to two A4 or 8½ x 11 in. pages maximum. It should be prepared as attractively as possible, much like a manuscript for journal submission. The text must be 10 points or larger in size. Mail seven copies of the Extended Summary to the Secretary-General. Submissions will be accepted after July 1, 1999. The Abstract and the Extended Summary must reach the Secretary-General no later than Monday, January 17, 2000.

Contributors will be informed of the decision of the International Papers Committee, and on the assignment of their paper to a session, by May 1, 2000.



INTERNATIONAL UNION OF  
 THEORETICAL AND APPLIED  
 MECHANICS



20th INTERNATIONAL  
 CONGRESS OF  
 THEORETICAL AND APPLIED  
 MECHANICS

Chicago, Illinois, USA  
 August 27 – September 2, 2000  
 Chicago Marriott Downtown

**First Announcement  
 and Call for Papers**

November 1998  
<http://www.tam.uiuc.edu/ICTAM2000>

# 9th (Millennium) International Symposium on Flow Visualization Edinburgh, Scotland, UK August, 22 - 25, 2000

## ***Preliminary Announcement and First Call for Papers***

The 9th. International Symposium on Flow Visualization will be held August 22-25, 2000 in Edinburgh, Scotland, UK. The Symposium is the latest in the series of International Flow Visualization Symposia, first held in Tokyo in 1977 and successively in Bochum, Ann Arbor, Paris, Prague, Yokohama, Seattle and Sorrento. The objective of the Symposium is to provide a forum for communication and information exchange in the broad field of Flow Visualization applied over a wide range of disciplines that depend upon this technique. As in the 8th. Symposium authors will be supported in publishing their work in an interactive, multimedia format on CD with the inclusion of digital video, animation, sound and colour being encouraged.

Original papers are solicited covering all aspects of Flow Visualization, both quantitative and qualitative. General topic areas include, but are not limited to, Flow Field Visualization, Surface Flow Visualization, Image Processing and Computer Aided Methods, Graphical Display of Data Sets and Numerical Flow Visualization.

### ***Session topics may include but are not limited to***

Acoustics; Advanced Techniques; Aircraft; Airfoils; Applications; Bluff Bodies; Cavity Flows; Channel Flows; Combustion; Cylinders; Delta Wings; Droplet Break-up; Electrodynamics; Engines; Fluidics; Holography; Industrial Processes; Infrared Thermography; Interferometry; Jets; Jets in Cross Flow; Liquid crystals; Low Reynolds Number Flows; Machines; Medical; Multiphase Flows; Natural Convection; Numerical Visualization; Particle Image Velocimetry; Porous Media Flows; Rotating Fluids; Schlieren; Shock Waves; Supersonic Flows; Three Dimensional Flows; Turbomachines; Turbulence; Two Phase Flows; Unsteady Flows and Instability; Vortices.

### ***Instruction to Authors***

Papers will be accepted on the basis of extended abstracts of no more than 4 pages including figures and references. The abstract template should be downloaded from <http://www.ode-web.demon.co.uk/8misfv/abs>. The abstract should include the title, author's name and affiliation, a concise statement of the problem, method of approach, results, conclusions and sample figures. Please identify the corresponding author. The abstract should be submitted, preferably electronically, by December 12th. 1999 for review. Final manuscripts will be due by May 15th., 2000 and will be published on CD Rom to be distributed at, and after, the Symposium. As with the 8th. Symposium, the CD will have an ISBN number and will be archived in the National Library of Scotland.

### ***Author's Schedule***

*Abstract submission deadline:* December 12, 1999  
*Notification of acceptance:* February 14, 2000  
*Electronic ready manuscript:* May 15, 2000

### ***Address correspondence and submissions to***

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