The Information Center for Multiphase Flow

NEWSLETTER

No.3
October 1994

ICeM

The Japan Society of Multiphase Flow

Second International Conference on Multiphase Flow (ICMF '95-KYOTO)

The Second International Conference on Multiphase Flow has received more than 380 papers submissions for oral and poster presentations. This number was far beyond our initial expectation of about 300 papers. The final screening was completed and the authors were notified of either acceptance or rejection of their papers in September. This decision was made by the International Scientific Committee by taking into account the reviewer's comments. The provisional programs are now being sought based on the results of this screening and the classification of all accepted papers into more than several categories. Roughly two thirds of the accepted papers will be allocated for oral presentation and the rest for poster presentation mainly for the technical reasons associated with the number of rooms available. This allocation of the type of presentations has been eventually decided based on the authors' choice together with the categories of the topics with which each paper deals, not based on the quality of the papers. Thus, the poster presentation never means the papers of poor quality. This is a very important philosophy of this conference.

Manuscripts and Publications

Authors of all accepted papers are requested to send their full-length manuscripts prepared on camera-ready mats up to 8 pages to Prof. T. Fukano, Co-Chairman of the Scientific Committee before December 15, 1994. All the papers arriving before this deadline will be included in the Conference Proceedings which will be available at the meeting. Those who are interested in submitting their full length papers for the Volume of the Selected Papers should produce their manuscripts prepared according to the Elsevier's instructions before December 15, 1994 for the reviews by international experts. This volume will be published by Elsevier Science Publishers B.V. immediately after the Conference.

To Join ICeM:

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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(ICMF '95-Kyoto)

Invited Lectures

The Conference is planning the following invited lectures for five Plenary and eleven Keynote Sessions. Please note that the schedule, the titles and etc. given below are tentative, and some changes may therefore be made later.

Plenary Lectures:

April 3, 1995	Prof. R.I. Nigmatulin (Russia),	"Multiphase flow model problems and industrial applications"
April 4	Prof. D.E. Stock (USA),	"Gas-solid two-phase flow"
April 5	Prof. K. Nishikawa (Japan),	"Development and future problems in boiling and multiphase flow researches"
April 6	Prof. J. Straub (Germany),	"Interfacial heat transfer and multiphase flow in micro-gravity"
April 7	Prof. G. Klinzing (USA),	"Application of neuro-network to multiphase flow"

Keynote Lectures (alphabetical order):

· Prof. S. Einav (Israel)	"Multiphase flows in biomedical engineering"
· Prof. G.M. Faeth (USA)	"Spray combustion: A review"
· Prof. T. Hanratty (USA	"Liquid droplet entrainment in annular-dispersed flow"
· Prof. M. Horio (Japan)	"Fluidyzed beds"
· Prof. D.D. Joseph (USA)	"The motion of particles in flows of viscoelastic liquids"
· Prof. S. Kotake (Japan)	"Molecular dynamic approaches in multiphase flow"
· Prof. M. Lance (France)	"Basic mechanisms in gas-liquid two-phase flow turbulence"
· Prof. R.T. Lahey, Jr. (USA)	"The CFD analysis of multi-dimensional phenomena in multiphase flow"
· Prof. B.G. Pokusaev (Russia)	"Wave propagation in gas-liquid two-phase flow"
· Prof. T.T. Theofanous (USA)	"Multiphase flow problems in nuclear reactor severe accidents"
· Prof. S. Zaleski (France)	"Direct numerical simulation of flows with interface"

Panel Discussions

Panel Discussions are planned on five specified subjects. In general, each panel discussion consists of one (or more) keynote lecture(s) or lectures by invited panelists and discussions. For details, please contact the organizer(s) of each panel session listed below:

- Panel Discussion A
  "Numerical simulation of multiphase flow phenomena in industrial application"
  Prof. V. Ransom (Purdue Univ., USA), Dr. Y. Murao (JAERI, Japan)
- Panel Discussion B
  "Molecular scale phenomena at phase-interfaces"
  Prof. Y. Matsumoto (Tokyo Univ., Japan)
- Panel Discussion C
  "How can we solve the problems in particle laden turbulent flow ?"
  Prof. K. Hishida (Keio Univ., Japan), Prof. J. K. Eaton (Stanford Univ., USA)
- Panel Discussion D
  "Technology of nuclear heat application and role of multiphase flow"
  Prof. H. Barnert (KFA, Germany), Dr. Y. Sudo (JAERI, Japan)
- Panel Discussion E
  "Measurement techniques in multiphase flows"
  Dr. J.M. Delhaye (CEA Grenoble, France)

Forum

This forum focuses on international technology sharing in the fields of energy, environment and health. The forum invites lectures given by international experts.

The following lectures are planned. For details, please contact one of Dr. J. H. Kim (EPRI, USA), Prof. K. Horii (Shirayuri Womens' College, Japan) and Prof. A. Serizawa (Conference Chairman).

- Genetic technology Prof. F. Murphy (University of California at Davis, USA)
- Global climate and ecology
- Technology sharing Dr. M. Kawasaki (Japan Research and Development Corporation)
- Energy problem

Conference Schedule

April 3 (Mon), 1995

9:00 ~	Registration
10:30 ~ 11:10	Opening ceremony
11:10 ~ 11:30	Coffee break
11:30 ~ 12:30	Plenary lecture (Prof. R.I. Nigmatulin)
14:00 ~ 18:00	Keynote lectures, Oral sessions, Coffee break
18:30 ~ 20:30	Welcome reception

April 4 (Tue)

9:00 ~ 10:00	Plenary lecture (Prof. D.E. Stock)
10:00 ~ 10:20	Coffee break
10:20 ~ 10:50	Chairman's review for poster sessions
10:55 ~ 12:35	Oral & Poster sessions
14:00 ~ 16:00	Keynote lectures, Oral sessions
16:00 ~ 16:20	Coffee break
16:20 ~ 18:20	Oral sessions, Panel discussions (A, B)

April 5 (Wed)

9:00 ~ 10:00	Plenary lecture (Prof. K. Nishikawa)
10:00 ~ 10:30	Coffee break
10:30 ~ 12:30	Panel discussions (C, D, E)
14:00 ~ 18:20	Keynote lectures, Oral sessions, Coffee break

April 6 (Thu)

9:00 ~ 10:00	Plenary lecture (Prof. J. Straub)
10:00 ~ 10:20	Coffee break
10:20 ~ 10:50	Chairman's review for poster sessions
10:55 ~ 12:35	Oral & Poster sessions
14:00 ~ 17:00	Forum
18:00 ~ 20:30	Banquet

April 7 (Fri)

9:00 ~ 10:00	Plenary lecture (Prof. G. Klinzing)
10:00 ~ 10:15	Coffee break
10:15 ~ 10:45	Chairman's review for poster sessions
10:50 ~ 12:20	Oral & Poster sessions
12:30 ~	Closing ceremony (Wine & cheese party)
13:30 ~	Technical Tours

Registration

Participants are strongly recommended to make an advanced registration for the Conference as soon as possible. This will make it easier for us to estimate the number of participants in advance, which facilitates our planning more smoothly. They may also be reminded that it is conditional that at least one of the authors of the accepted papers attends the Conference to present their papers regardless of the types of presentation (oral or poster).

A New Addition to Members of the Supporting Organizations

The Ministry of Transportation of Japanese government has recently decided formally to support this Second ICMF.

New Kansai Airport Open

Kansai International Airport opened on September 4, 1994 as scheduled. The direct railway service, special express "Haruka", is available every 30 minutes between the airport and Kyoto.

Finally, we welcome all of you to attend the Second International Conference on Multiphase Flow and to enjoy Kyoto during the beautiful cherry blossom season.

Professor Akimi Serizawa
Conference Chairman

MULTIPHASE FLOW RESEARCH AND SYMPOSIUMS IN CHINA

In China many multiphase flow studies are related with the engineering problems of gas-liquid flows in boilers, nuclear reactors and chemical reactors, such as the pressure drop, void fraction distribution, flow regimes, critical flows, unsteady flows etc. The studies in this field are conducted mainly in : the Department of Energy, Xi'an Jiaotung University; the Institute of Nuclear Energy and Department of Thermal Engineering, Tsinghua University; the Institute of Chemical Engineering, Dalian University of Science and Technology. Some problems of steam-droplet flows in steam turbines, such as the erosion in turbine blades, are studied in the Institute of Engineering Thermophysics, the Chinese Academy of Science, and the Department of Energy, Xi'an Jiaotung University.

In recent years, more and more multiphase flow studies in China are focused on gas-solid flows for solving such engineering problems, as how to save energy in pneumatic and hydraulic conveying, to reduce the pressure drop and to increase the collection efficiency in cyclone separators, highly efficient and clean coal combustion in pulverized-coal combustors and furnaces, gas-particle flows in bubbling and circulating fluidized beds, solid-rocket exhaust gases, and gun barrels, air-sand flows in desert. The liquid-solid flows, such as sedimentation in rivers are also studied. The problems listed above are studied in : the Department of Engineering Mechanics, the Department of Thermal Engineering, and the Department of Hydraulic Engineering, Tsinghua University; the Department of Mechanics and the Department of Thermal Engineering, Zhejiang University; the Department of Mechanics, Beijing University; the Institute of Thermal Engineering, Southeast University; the Nanjing University of Science and Technology; the Department of Energy, Xi'an Jiaotung University; the Changsha Defense University of Science and Technology; the Institute of Mechanics, the Institute of Engineering Thermophysics, the Institute of Chemical Metallurgy, and the Institute of Air-sand Flows, the Chinese Academy of Science; the Institute of Water Conservancy and Hydroelectric Power Research.

In developing the numerical modeling of turbulent gas/liquid-particle/droplet flows, a series of work have been done in the Two-phase Flow and Combustion Laboratory, Department of Engineering Mechanics, Tsinghua University. Two-fluid models with different closure methods--three levels of two-phase turbulence models: a unified second-order-moment-PDF model accounting for both nonisotropic turbulence of two phases and particle-fluid turbulence interaction in two-way coupling; its isotropic form-- k-ε-k_p model and a simplified k-ε-Ap model are proposed. For turbulent combusting gas-particle flows, a pure two-fluid model and a continuum-trajectory model of reacting particles are proposed. These models have been applied in simulating gas-particle jets, 2-D and 3-D recirculating and swirling flows. Other studies in this field in China are developing discrete vortex model of two-phase flows by the Northwest Technical University and Zhejiang University, modified stochastic particle trajectory models by the Tsinghua University, Zhejiang University and Xi'an Jiaotung University.

In measurements of two-phase flows, many universities and research institutes use the Malvern instrumentation for measuring particle/droplet size and size distribution. The high-speed photography, the laser holography, the laser

speckle and the modified laser Doppler velocimeter with a discriminator for measuring two-phase flows have been used in many cases. Recently, the Phase Doppler particle anemometer(PDPA), the PIV and laser optic fiber methods have been studied and applied in China.

There have been different kinds of multiphase flow symposiums held in China during the last 20 years. The most important symposiums, perhaps, are the First, Second and Third National Symposiums on Multiphase Fluid, Non-Newtonian Fluid and Physicochemical Fluid Dynamics, sponsored by the Multiphase Fluid Dynamics Division, the Chinese Society of Theoretical and Applied Mechanics (CSTAM), Held in Chengdu(1974), Beijing(1982) and Hangzhou(1990) respectively. The Fourth National Symposium on Multiphase Fluid, Non-Newtonian Fluid and Physico-chemical Fluid Flows, Jointly sponsored by the CSTAM, CSET(The Chinese Society of Engineering Thermophysics), CSCE(The Chinese Society of Chemical Engineering) and CSPE(The Chinese Society of Petroleum Engineering), was held in Xi'an, 1993. International Symposiums were also organized in China. The International Symposium on Multiphase Flows, sponsored by the CSTAM and the Zhejiang University, was held in Hangzhou in 1987. Prof. C.T. Crowe was the Chairman of this symposium. The First and Second International Symposiums on Multiphase Flows and Heat Transfer, sponsored by the CSET and Xi'an Jiaotung University were held in Xi'an in 1984 and 1989 respectively, and the coming Third Symposium will be held in September, 1994. The First and Second International Symposiums on Coal Combustion (including gas-solid flows), sponsored by the CSET, ASME, JSME and Tsinghua University were held in Beijing in 1987 and 1991 respectively, and the coming Third Symposium will be held in 1995. Besides, an international symposium on measurement techniques for multiphase flows, sponsored by the Chinese Society of Measurement Techniques and the Southeast University will be held in Nanjing in 1995. An international symposium on multiphase fluid, non-Newtonian fluid and physico-chemical fluid flows, jointly sponsored by the CSTAM, CSET, CSCE, CSPE and the Beijing Petroleum University will be held in 1996.

The Chinese scientists have wide communication and cooperation with their international colleagues, for example, the famous scientists C.T. Crowe, S.L. Soo, Y. Tsuji, M. Sommerfeld, etc. They have attended the Third International Symposium of Gas-Solid Flows(La Jolla, 1989), the 18th and 23th Annual Meetings of Fine Particle Society(Boston, 1987 and Las Vegas, 1992), The Second World Congress on Powder Technology(Kyoto, 1990), the International Conference on Multiphase Flow, "Tsukuba'91"(Tsukuba, 1991), the 4th, 5th and 7th Workshop on Two-phase Flow Predictions (Erlangen, 1987, 1990, and 1994).

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Report on the International Union of Theoretical and Applied Mechanics Symposium on "Waves in Liquid/Gas and Liquid/Vapor Two-Phase System"

Chairmen: S. Morioka & L. van Wijngaarden
Scientific Committee: D. G. Crighton (UK), J. M. Delhaye (France)
V. K. Kedrinskii (Russia), G.E.A. Meier (FRG), S. Morioka (Japan)
A. Prosperetti (USA), B. Sturtevant (USA)
L. van Wijngaarden (The Netherlands)

The IUTAM symposium on "Waves in liquid/gas and liquid/vapor two-phase system" was held in Kyoto, Japan, 9-13 May 1994. 63 scientists participated and 42 lectures were presented. The topics in the symposium may be classified as (1) waves in liquid-bubble systems including interfacial effects [14], (2) waves in gas-droplet system [5], (3) waves in film or stratified systems [6], (4) waves with liquid-vapor transition [7], (5) waves with vapor-liquid transition [6], (6) wave propagation near critical point [3], and (7) waves with low pressure effect [1]. The numbers in brackets denote the number of contributed papers. Of course, some lectures may cover several topics.

As for the topics of (1), there is a remarkable progress in relation to the well-posedness of the governing equations of void waves. Experiments, numerical simulations and analytical approaches to waves in bubbly liquids have been discussed, both regarding propagation properties and stability. The importance of hydrodynamic interactions is now well recognized. Their description in terms of potential theory is adequate for the evolution of plane nonlinear waves but not for the prediction of instabilities. Obviously, more of the physics must be incorporated.

The researches of (2) have been developed from statistically homogeneous and rarefied droplets to statistically inhomogeneous and non-rarefied ones. This tendency can be seen in the researches of (1), too. The numerical simulation seems to be the most promising method for this purpose. In this symposium, such numerical methods have been presented, and various new phenomena have been found for collisions between droplet-droplet, droplet-liquid layer, and droplet-solid wall.

As for the topics of (3), many lectures have been presented, since the equations describing such waves can be reduced to the Benny's equation, which provides a chaotic solution. It is one of the results in this symposium that this type of equation appears in a variety of flow pattern of two-phase flow.

The problems of (4) and (5) have been developed from one-dimensional equilibrium wave to multi-dimensional non-equilibrium one, associated with non-evolutionarity of the one-dimensional discontinuity analogous to detonation and deflagration waves. On the other hand, many practical problems have been treated and many interesting phenomena have been shown.

As for (6), the problems solved up to date have been arranged principally for a retrograde fluid and the remaining problems have been discussed. The necessity for extending to the multi-dimensional, non-equilibrium problem has been recognized, as in (4) and (5).

The proceedings of this symposium will be published from Kluwer Academic Publishers nearly next year.

Prof. S. Morioka
Kyoto University, Japan

Report on the International Conference
"New Trends in Nuclear System Thermohydraulics"

This Conference was held in Pisa (I), at the Congress Hall of the University, in the period May 30-June 2, 1994.

The Conference was organized by the Dipartimento di Costruzioni Meccaniche e Nucleari, under the patronage of Pisa University in the 650th Anniversary since its foundation, in cooperation with the International Atomic Energy Agency and with the support of: Ansaldo S.p.A., Commission of the European Communities, CNR, ENEA, ENEL S.p.A., IAEA, IBM-SEMEA, QUALITAL.

The Conference was co-sponsored by: American Nuclear Society, ANDIN, Atomic Energy Society of Japan, Canadian Nuclear Society, CIRTEN, European Nuclear Society, Italian Nuclear Society, Italian Society for Physics, Korean Nuclear Society, OECD/Nuclear Energy Agency, Russian Nuclear Society, SIPS, US Nuclear Regulatory Commission.

The Conference was subdivided in two main Topic Areas: Primary and Secondary Thermohydraulics and Severe Accidents and Containment Thermohydraulics. It provided an overview of the present status of research and technical activities in relation to the thermohydraulics of light water nuclear reactors. To this aim, in collaboration with IAEA, contributions from all over the world were collected, resulting in about 160 papers that were presented and included in the Conference Proceedings. In addition, four invited lectures provided the audience with interesting discussions on relevant issues, namely:

- M. Reocreux "Current and Future Trends in Nuclear Reactor Thermohydraulics"
- R.T. Lahey "The Analysis of Non-Linear Instabilities in Boiling Systems"
- H. Soda "Current Trends in Severe Accident Research"
- H. Karwat "Containment Requirements for Future Reactors"

Over 300 scientists took part to the Conference, mostly coming from foreign countries.

The Conference was closed by a panel discussion, chaired by P. Fornaciari of ENEL, with the participation of experts from USA, France, Japan, Russia and Germany as well as Italy. The panel was introduced by the IAEA Director of NPP Safety Division, P.E. Juhn, who presented the paper "Role of Nuclear Power for Sustainable Development".

As a summary, it can be affirmed that the Conference was a very successful event, giving the state of the art in the thermohydraulics applications to NPP safety and outlining main open questions as:

- specific aspects of eastern countries LWRs;
- particular phenomena not completely studied (instabilities in boiling channels, 2D and 3D aspects relevant to new reactor designs, etc.);
- specific aspects of severe accidents and containment behavior.

A limited number of the conference proceedings, which include all invited and contributed papers (a total of about 1500 pages, in two hard cover volumes) are available at the Conference Secretariat.

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Report on the 31st Meeting of the
European Two-Phase Flow Group
6-8 June, 1994 - Piacenza, Italy

The 31st European Two-Phase Flow Group Meeting was held at Piacenza, Italy, hosted by SIET (Society for the Information on Thermal-Hydraulic Experiments). The European Two-Phase Flow Group meets every year in a European country, discussing very informally the latest research presented by delegates in plenary sessions. There are not formal Proceedings of the meeting. Each author is requested to bring with him 75 copies of the report summarizing his findings. It is typical that papers are usually completed the last days before the meeting and present the work often actually in progress. Discussion is often a source of new ideas for continuing the research work.

The 34 papers were presented in nine plenary sessions distributed over two and a half days. Sixtyfive people attended the meeting giving rise to animated discussions after each talk.

The thirty-four papers covered problems of:

* Qualification and development of LWR components (steam injector, vertical plates exchanger, condensers for SBWR);
* Safety analysis of LWR (two-phase natural circulation in PWR, inadvertent ADS opening and cold leg break transients in AP600);
* Critical flow and two-phase flow through special components (T-junction, two-phase critical flow in converging-diverging nozzle and in cracks, two-phase pressure drop in sudden expansion);
* Flow structure (two-phase flow in 3-parallel channels, liquid phase distribution in the upper plenum of a PWR, void fraction evaluation, analysis of two-phase flow using conductivity probes, void waves and instabilities in bubbly flows, flow reversal two-phase flow in parallel channels);
* Multiphase flow (thermal two-phase plumes, particle turbulence interaction, local void fraction measurement, aerosol deposition in venturi scrubber);
* Mathematical analysis (simulation of a SBLOCA, eulerian 3-D simulation of convective boiling, multidimensional two-phase flow, Marangoni driven convection);
* Critical heat flux (CHF correlation for low pressure conditions, CHF correlation at inlet conditions, COBRA subchannel analysis models, correlation and mechanistic model for the prediction of water subcooled flow boiling CHF, visualization of high heat flux burnout);
* Heat transfer (onset of subcooled flow boiling, flow pattern in an immiscible liquid-liquid mixture, boiloff phenomena, condensation with non-condensable gas).

A possible linkage with Japanese experts have been outlined by some delegates.

Information about programme and/or papers may be obtained contacting:

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UIT (Italian Union of Thermo-fluid-dynamics)
Report on 12th National Heat Transfer Conference
June 23-24, 1994 - L'Aquila, Italy

UIT (Italian Union of Thermo-fluid-dynamics) organizes every year a national heat transfer conference with the participation of researchers presenting experimental and/or theoretical contributions in the field of Heat Transfer, Fluid Mechanics and Thermodynamics. The aim of the conference is to promote a national forum to compare and exchange results obtained at University, Government and industry research centres. The 1994 edition was held in L'Aquila (centre of Italy) from 23 to 24 June, 1994, and was organized by the Energy Department of the L'Aquila University.

The conference consisted of 4 themes, subdivided into 11 sessions, respectively on : a) Thermo-fluid-dynamics of single-phase systems; b) Thermo-fluid-dynamics of multiphase systems; c) Computational Thermo-fluid-dynamics; and d) Nuclear and conventional energy systems.

A total of 46 papers was presented, including 8 papers from abroad, and about 75 people attended the conference.

Two invited lectures were delivered by Prof. Y.I. Miropolski (The role of cooling for the supercomputer design) and by Dr. M.W. Collins (The application of fluid dynamics to nanoscale problems in biomedical engineering), providing an updated state-of-the-art review.

Recent results obtained in the italian academia, national industry and government labs have been presenting, stimulating a fruitful discussion among participants. Main topics treated and discussed are reported herewith.

An experimental research on direct contact evaporation of liquid jets of R 114 into water allowed to get a thorough characterization of the evaporation rate. The evaporation of a liquid jet flowing upwards in a stagnant water column has been described using an isolated single drop model providing correction factors determined from the ideal behavior: i.e. drops falling down (negligible for water superheating > 20 K) and local cooling of the water column, due to drop evaporation, on the following drops (negligible for water superheating > 15 K).

A newly developed mechanistic model based on the liquid sublayer dryout mechanism for the prediction of the critical heat flux in subcooled flow boiling at high liquid velocity and subcooling has been presented. The proposed model, tested on a wide data set of 1888 data points is particularly useful in the thermal hydraulic design of fusion reactor high heat flux components.

A very interesting boiling phenomenon in finned channels, called Hypervapotron effect, is studied from the theoretical viewpoint. Application of the hypervapotron effect is of great interest for the removal of high heat fluxes wherever high velocity and subcooling of the coolant are not allowed. The proposed mathematical model is based on integral energy conservation equations applied to the domain constituted by the walls and the fluid in the region delimited by two adjacent fins, and provides very good predictions of the heat transfer results obtained in previous experiments.

Tests performed to study the heat transfer capabilities from a plate cooled by a falling water film in the presence of countercurrent air flow supplied new data of interest for predicting the behavior of passive containment cooling systems (PCCS) in simplified pressurized water reactors (e.g. AP600). In particular, the adequacy of the heat and mass transfer analogy for calculating evaporation flow rate has been confirmed. On this basis a detailed model for predicting the behav-

ior of a steel liner with internal heating and external spray was set up, obtaining reasonable predictions of the evaporation flow rates observed in the experiments.

The instability of a flat horizontal gas-liquid interface subjected to gravity and static electric field has been studied, in order to assess the effect exerted by an electric field on pool boiling regimes and transitions such as peak heat flux, minimum film boiling and film boiling. The two limiting cases: a) gas perfect insulator and liquid perfect conductor, and b) gas and liquid perfect insulators, are treated. An energetic approach has been adopted to solve the problem and rather general results have been obtained, in good agreement with theoretical and experimental outcomes reported in the past by other researchers.

New experimental data for CHF and for pressure drop at CHF condition in long horizontal capillary tubes (D = 0.5 and 1.0 mm L/D = 500 and 975) at various pressure, mass flux and inlet subcooling have been presented. Two distinct trends are recognized in CHF data and, upon comparison with the Katto-Ohno correlation, they are identified as corresponding to the L - and H - regime. Under conditions of fixed exit pressure and inlet subcooling, CHF attains a higher value as D decreases. Pressure drops at CHF condition are well predicted using the Friedel correlation.

The 13th UIT National Heat Transfer Conference will be held at Bologna in June 1995.

From May 29 to May 31, 1996, the 14th UIT National Heat Transfer Conference will be held at Rome, jointly with the 2nd European Conference on Thermal-Sciences. Non-european participants will be welcome.

For further information on UIT activities:

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To Members:

For the 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 manuscripts are sent by E-mail or if diskettes are attached to manuscripts submitted.

Report on "7th International Symposium on Applications of Laser Techniques to Fluid Mechanics & Selected Paper Volume from Springer-Verlag"
July 11-14, 1994, Lisbon, Portugal

The Symposium is held every two years in Lisbon. The prime objective is to provide a forum for the presentation of the most advanced research on laser techniques for flow measurements, and reveal significant results to fluid mechanics. The applications of laser techniques to scientific and engineering fluid flow research is emphasized, but contributions to the theory and practice of laser methods are also considered where they facilitate new improved fluid mechanic research. Attention is focused on laser Doppler anemometry, particle sizing and other methods for the measurement of velocity and scalars such as particle image velocimetry and laser induced fluorescence.

190 papers were selected from 300 extended abstracts and over 30 papers for 6 two-phase flow sessions were presented. In every meetings the improvement for the measurements in two-phase flow has been seen significantly. Hot discussions and proposals were made for the precise measurement of PDA and for non-spherical particle measurements this year.

A selected papers version bound volume stemming from 6th Symposium is published from Springer-Verlag, which involves 6 two-phase flow papers within the total 30 papers. The next bound from 7th Symposium will published soon.

The Symposium was organized by R.J.Adrian, D.F.G.Durao, F.Durst, M.V.Heitor, M.Maeda and J.H.Whitelaw. The next Symposium is held in Lisbon/Portugal on 8-11. July 1996. Welcome nice papers.

Prof.Dr. Masanobu Maeda
Mechanical Engineering Department
Keio University, Yokohama, Japan

New Books

Momentum and Heat Transfer in Turbulent Gas-Solid Flows
Authors:
Zinovy R. Gorbis, Ph.D.
Mechanical, Aerospace & Nuclear Engineering Department, 43-133 Engineering IV, UCLA, TEL +1-310-825-5099, FAX +1-310-825-2599
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Keywords: Gas-solid flows, Turbulence, Component interaction, Heat transfer, Convection, Radiation
Publisher: Begell House Inc. Publishers
Year: End of 1994
Total number of pages: 396
Language: English

Turbulence Modeling for CFD
Author: David C. Wilcox
This book has been written to show that turbulence modeling can be done in a systematic and physically sound manner. An ideal model should introduce the minimum amount of complexity while capturing the essence of the relevant physics is the fundamental premise. For university people, the material presented is appropriate for a one-semester, first or second year graduate course. For practicing engineers, the text should serve as an invaluable reference for years to come. A completely objective point of view is taken in assessing the merits of models and their range of applicability.
Total number of pages and prices:
480-page hard-back text $75.00
224-page paper-back solution manual $40.00
Contact: DCW Industries, Inc., 5354 Palm Drive, La Canada, California 91011, USA, TEL +1-818-790-3844, FAX +1-818-952-1272

Report on The 13th Multiphase Flow Symposium '94
July 13-15, 1994, Tsukuba, Japan

The 13th Multiphase Flow Symposium '94 was held at The University of Tsukuba, Japan on July 13 to 15, 1994. The place of Symposium was The University Hall where International Conference on Multiphase Flows '91-Tsukuba was held.

The Symposium program included the followings: three invited papers, 29 presentations in six organized technical sessions, five presentations in a forum, and 89 contributed papers. About 240 people including several people from abroad attended the Symposium.

In the organized sessions, activities and updated state-of-the-art research reports of six technical and research committees (on two fluid model, for examination of a thermohydraulic analysis code based on three-fluid model, for graphic simulation and visualization of multiphase flow, of multiphase flow forum in Kansai, Tohoku multiphase flow, and on non-linear dynamics in multiphase flow) under The Japan Society of Multiphase Flow (JSMF) were reviewed. These are very valuable.

The forum held in the evening on the first day attracted the interest of many participants beyond expectation. In the forum, five examples of their industrial and practical problems were presented and discussed at the stand of view of the cooperation among industries, national institutes, and universities in a similar way to the Symposium last year.

Three invited lectures were delivered by Prof. A. Serizawa, Kyoto University (Functionalization and Adoption of Artificial Intelligence in Controlling Multiphase Flow), Dr. M. Watanabe, National Institute for Environmental Studies, Japan (Global Environment and Multiphase Flow), and Prof. T. Ogawa, Institute of Applied Physics, University of Tsukuba (Science on Form and Multiphase Flow).

The fields interested in the 26 general sessions were as follows: Numerical simulation, Visualization, Flow characteristics, and Industrial technology. As the first best presentation award, local wines were presented to two young speakers. The Symposium proved fruitful and successful.

We had the JSMF award ceremony in 1994 during the Symposium. Emeritus Professors K. Nishikawa (Kyushu University) and T. Kawasima (Tohoku University) were awarded the JSMF Prizes for their outstanding contributions to development of multiphase flow researches, respectively. Dr. T. Tanaka (Osaka University) also won the JSMF award (for young scientists and engineers) for his distinguished work.

The abstracts in English of the Symposium are available from the corresponding members and ICeM committee members.

Next Symposium is to be held at The Matsuyama General Community Center, Ehime, Japan on July 13 and 14, 1995 (see Future Meetings).

Prof. Goichi Matsui
Chairman of the Executive Committee of the Symposium
University of Tsukuba, Japan
Fax: +81-298-53-5207

Report on "The Third JSME-KSME Fluids Engineering Conference"

The Third JSME-KSME Fluids Engineering Conference was held on July 25-27, 1994 in Sendai, Japan. The total numbers participated in this conference were 234 who are 114 Japanese, 113 Korean and 7 other foreigners.

The First Conference was held in Seoul, Korea 1988 under the name of the First KSME-JSME Thermal and Fluids engineering Conference to stimulate the professional communities and enhance the technical activities in the area of thermal and fluids engineering in Japan and Korea. However, after the first conference, it was agreed between the Committee Members of both countries that the two conferences of thermal engineering and fluids engineering would be held separately. The Second KSME-JSME Fluids Engineering Conference was held again in Seoul on Oct. 10-13, 1990. Hence, this conference was third one which was held firstly in Japan in this series.

At this conference, 131 papers were presented in 30 technical sessions which include a wide variety of topics in the field of fluids engineering.

The plenary lecture was given by Prof. J.M. Fyun (Korean Advanced Inst. of Sci. and Tech.) with the title of "Some fundamental notions of mechanica-lly-driven cavity flows".

The topics of the fluids engineering research and technology were concentrated on the problems of two-phase flow (20 papers), turbulent flow (20 papers) and flow with heat transfer (17 papers). The reason of many presen-tation of last topic is that the Korean participants belong to the thermal and fluids engineering division of KSME.

It was also noted that the explanation of complex flow phenomena by using numerical simulation method was extended in various flow fields.

The general atmosphere of enthusiasm and the spirits of participants of the speakers and audience were sincere and invigorating. Discussions were usually lively interesting and productive though they were spoken more acti-vely from Korean side.

As the special event in the conference, the visiting tour to the Institute of Fluid Science, Tohoku University was planned. Also, the visit to the Hitachi Co. Ltd. was scheduled as the post conference tour. Many participants from the Korean side joined in these technical tours and enjoyed very much.

Prof. S. Kamiyama
Chairman
Tohoku University, Japan

To Corresponding Members:

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 "10th INTERNATIONAL HEAT TRANSFER CONFERENCE"
14 - 18 August 1994, BRIGHTON, UK

10th international heat transfer conference was held in UK, which was the first held in the UK since 1962. According to the programme 533 technical papers were presented in the 18 technical sessions, such as S1; Radiation and Combustion, S2; Measurement Techniques, S3; Numerical Techniques and Modelling, S4; External Forced Convection, S5; Heat Transfer in Nuclear and Conventional Heat and Power Generation Systems, S6; Condensation and Direct Contact Gas-Liquid Heat Transfer, S7; Freezing, Melting and Solidification, S8; Internal Forced Convection, S9; Heat Exchangers, S10; Pool Boiling, S11; Particulates, Porous Media and Special Applications, S12; Natural and Mixed Convection, S13; Heat Transfer Augmentation, S14; Two-Phase Flow With and Without Phase Change, S15; Conduction and Insulation, S16; Natural Convection, S17; Applied Heat Transfer, S18; Flow Boiling, and S19; Industrial, S20; Open Forum Sessions.

Each paper was presented as a poster for two hours followed by a keynote lecture which was within the subject area of the session. This was followed by a discussion session which should address the poster papers. In the discussion session one wine bottle was given to author/s of the best poster presentation of about 30 papers in each session. There were Industrial and open forum poster sessions as well as 12 special Keynote Lectures.

Table 1 shows the number of papers and participants classified into different countries. It is noticed that about a half of the papers and participants came from USA, JAPAN and UK.

On just the same day I arrived Brighton, one of the best summer resort in England, a bomb explosion accident took place there. Therefore the entrance of the conference meeting place was very strict to enter into there.

The conference was nicely organized. Only the discussion sessions which were prepared to discuss the papers in the poster sessions were inactive, because almost all the questions and answers were finished for two hours and the discussions, generally speaking, were not interesting.

I personally enjoyed this conference very much, having fruitful discussion, meeting many good friends from many countries, having nice talking with them, especially getting two wine bottles. I will pay my respects to all the staffs of the conference.

Prof. Tohru Fukano
Kyushu University, Japan

Table 1

	Number of Paper	Participant
USA	133	139
Japan	91	125
UK	70	143
Germany	45	59
France	43	68
Russia	43	48
Canada	38	27
China	31	26
Israel	19	30
South Korea	17	22
Other 33 Countries	105	173
Total	635	860

Report on the first German-Japanese Symposium on Multi-phase Flow

A binational symposium on multi-phase flow was organized at the Nuclear Research Center Karlsruhe on August 23-25, 1994. The excellent experience of the meanwhile well accepted Japan-United States Seminar on Two-Phase Flow Dynamics acted as a strong incentive to initiate this German-Japanese Symposium.

From the beginning, the meeting was intended to provide a forum for experts and young scientists of two well industrialized countries to discuss recent investigations and to exchange information and opinions about new directions in multi-phase flow research and development. During two and a half days of the symposium 44 invited contributions were presented covering a wide (partly heterogeneous) range of multi-phase flow topics such as: fundamental experiments, instrumentation and measuring technique, boiling and critical heat flux, stability of two-phase flow, condensation and evaporation phenomena, cavitation and two-phase flow in rotary pumps, three-component two-phase flow, multi-phase flow modeling, two-phase flow research concerning light-water reactor systems. Actually, the sessions of the symposium were organized under corresponding headlines. The symposium started with two brief survey presentations on multi-phase flow research and teaching activities, as well as funding institutions and sponsoring organizations of the two countries. Moreover, it was framed by two survey lectures on two phase flow research work associated with the operation and the safety of pressurized and boiling water reactor systems. All papers presented at the meeting are compiled in two volumes of Proceedings (KfK-Reports 5389 and 5411).

In general, the symposium represented a composition of fine research and development work, which can be specified as application related, application oriented, or even as fundamental investigation. There were several highlights among the presented subjects. To our opinion (as chairmen) it has been demonstrated by several papers that

- computer-aided visualization technique in experiments (CADE) is a highly efficient and very much needed tool to gain deeper physical understanding of multi-phase flow,
- direct numerical simulation, a rigorous analytical computation of non-equilibrium and interfacial dynamics can provide decisive understanding of fundamental phenomena not easily accessible to experimental investigations. This is particularly so if computer aided visualization of computational results (CADC) is employed.
- taking into account turbulence phenomena in the modeling of dispersed and stratified two-phase flow is a necessary next step in multi-phase flow modeling.

Considering the symposium in summary, we believe, it has achieved its main goals namely to involve young scientists and research engineers in the exchange of information with their colleagues, to renew old and form new acquaintances.

We wish the first German-Japanese Symposium on Multiphase Flow a continuation in due time.

Prof. U. Müller (KfK, Germany),
Prof. T. Saito (The University of Tokyo, Japan)
The chairmen of the symposium

Future Meetings

Listings include Conference Name, Place, Date and Contact.

* Winter Annual Meeting (MFTC)
Chicago, Illinois, USA, November 6-11, 1994
Dr. M.L. Billet, Head, Fluid Dynamics Dept., Applied Research Lab., Pennsylvania State University, P.O. Box 30, State College, PA 17804, USA, Tel +1-814-865-3001, Fax +1-814-865-3287

* ANS Annual Winter. Multiphase Flow Experiments & Instrumentation
Washington DC, USA, November 13-18, 1994
Prof. M. Ishii, School of Nucl. Eng. Purdue Univ., 1290 Nuclear Eng. Bldg. West Lafayette, IN 47907-1290, USA, Tel +1-317-494-4587, Fax +1-317-494-9570,
Dr. Richard Lee, Div. of Systems Research, U.S. Nuclear Regulatory Commission, 5650 Nicholson Ln., Roclville, MD 20852, USA, Tel +1-301-492-3560, Fax +1-301-492-3585

* The International Katachi U Symmetry Symposium
Tsukuba, JAPAN, November 21-25, 1994
Prof. T. Ogawa, Institute of Applied Physics, University of Tsukuba, Tsukuba, 305, Japan
Tel & Fax +81-298-53-5028

* Symposium on Mechanics and Combustion of Droplets and Sprays
Taipei, TAIWAN, December 6-8, 1994
Dr. N.A. Chigier, Carnegie-Mellon Univ., Pittsburgh, PA 125123, USA

* IUTAM Mechanics and Combustion
Taipei, CHINA, December 6-10, 1994
N. A. Chigier, Carnegie-Mellon Univ., Pittsburgh, PA 15123, USA

* Fifth International Conference of Fluid Mechanics (ICFM5)
Cairo, EGYPT, January 2-5, 1995
Prof. M. Abou Rayan (Secretary General), Mech. Eng. Dept. Mansoura University, El-Mansoura 33516, Egypt, Tel +20-205-0344105, Fax +20-205-0347900

* Workshop on Computation and Modeling of Multiphase Flows
Santa Barbara, California, USA, January 9-13, 1995
Prof. S. Banerjee, Tel +1-805-893-8692, Fax +1-805-893-4731, E-mail carina@squid.ucsb.edu

* 8th International Conference on Transport and Sedimentation of Solid Particles
Prague, CZECH REPUBLIC, January 24-26, 1995
Dr. Vladimir Havlik, CTU Prague, Faculty of Civil Engineering K 141, Thákurova 7, 166 29 Prague 6, Czech Republic, Tel +42-2-3324331, Fax +42-2-24310782, 422
E-mail HAVLIK@vm.fsv.cvut.cz

* EUROMECH - Flows with Phase Transition (EUROMECH Colloquium 331)
Göttingen, GERMANY, March 13-16, 1995
Prof. Dr. Gerd E.A. Meier, DLR-Institut für Experimentelle Strömungsmechanik, Bunsenstaße 10, D-37073 Göttingen, Germany, Tel +49-551-709-2177, Fax +49-551-709-2889

* 1995-The Year of Compliance The 20th International Technical Conference on Coal Utilization & Fuel Systems
Clearwater, FL, USA, March 20-23, 1995
Coal Utilization and Fuel Systems Conference Committee, Attention: B. Sakkestad, 1156 Fifteenth Street, NW, Suite 525, Washington, DC 20005, USA, Tel +1-202-296-1133, Fax +1-202-223-3504

* 4th Int. Congress on Optical Particle Sizing
Nuremberg, GERMANY, March 21-24, 1995
Prof. Dr. F. Durst, Lehrstuhl für Strömungsmechanik Universität Erlangen-Nürnberg, Cauerstr. 4, D-91058 Erlangen, Germany, Tel +49-9131-85-9501, Fax +49-9131-85-9503

* JSME Spring Annual Meeting
Tokyo, JAPAN, March 29-31, 1995, (Abstracts due: November 1, 1994)
The Japan Society of Mechanical Engineers, Shinjuku Sanshin Bldg., 4-9, Yoyogi 2-chome, Shibuya-ku, Tokyo, Japan, Tel +81-3-3379-6781, Fax +81-3-3379-0934

* 2nd International Conference on Multiphase Flow '95 - Kyoto
Kyoto, JAPAN, April 3 - 7, 1995
Prof. A. Serizawa, Dept. of Nuclear Engineering, Kyoto University, Yoshida, Sakyo-ku, Kyoto 606, Japan, Tel/Fax +81-75-753-5829, (see p.1 for more information)

* International Symposium on Measuring Techniques for Multiphase Flows
Nanjing, CHINA, April 11-14, 1995
Prof. Wang, Shimin, Thermoenergy Engineering Research Institute, Southeast University, Nanjing 210018, China, Tel +86-25-7714519, Fax +86-25-7714489

* Convective Flow Boiling, An International Conference
Banff, CANADA, April 30-May 5, 1995
Prof. J. C. Chen; Fax +1-215-758-5057, Prof. Y. Fujita; Fax +81-92-641-9744,
Prof. F. Mayinger, Fax +49-89-2105-3435, Engineering Foundation, Fax +1-212-705-7441

* IX International Heat Pipe Conference
Albuquerque, NM, USA, May 1-5, 1995
Dr. Jean C. Stark, P.O. Box 1663, Protocol Office, MS P366, Los Alamos, NM 87545N, USA
Tel +1-505-667-6574, Fax +1-505-667-7530

* International Symposium on Cavitation
Deauville, FRANCE, May 2-5, 1995
Dr. B. Gindroz, CAV'95, DCN Bassin d'Essais des Carènes, Chaussée du Vexin F-27100
Val de Reuil, France

* ICHMT, International Seminar on Heat and Mass Transfer in Severe Reactor Accidents
Cesme, TURKEY, May 21-26, 1995
Prof. J. T. Rogers, Tel +1-613-788-5692, Fax +1-613-788-5715

* 26th AIAA Fluid Dynamics Conference
San Diego, CA, USA, June 19-22, 1995
AIAA, Meetings Department , 370 L'Enfant Promenade, SW Washington DC 20024, USA
Tel +1-202-646-7453

* IUTAM-Symposium on Asymptotic Methods for Turbulent Shear Flows at High Reynolds Numbers
BoChum, GERMANY, June 26-30, 1995
Prof. K. Gersten, Institut für Thermo-und Fluiddynamik, Ruhr-Universität Bochum,
Universitätstrasse 150 D-44780 Bochum, Germany, Fax +49-234-7094-162

* Moving Boundaries '95, Third International Conference on Computational Modeling of Free and Moving Boundary Problems
Bled, SLOVENIA, June 27-29, 1995
Prof. L. C. Wrobel, Wessex Institute of Technology, University of Portsmouth, Ashurst Lodge,
Ashurst, Suthampton, SO4 2AA, UK, Tel +44-703-293223, Tax +44-703-292853,
E-mail CMI@uk.ac.rl.ib, Intl E-mail CMI@ib.rl.ac.uk; or Dr. B. Sarler, LFDT, Faculty of Mechanical Engineering, University of Ljubljana, Askerceva 6, 61000 Ljubljana, Slovenia, Tel +386-61-1254-217

* Third International Conference on Combustion Technologies for a Clean Environment
Lisbon, PORTUGAL, July 3-6, 1995, (Abstracts due: October 15, 1994)
Prof. Maria da Graça Carvalho, Mechanical Engineering Department, Instituto Superior Técnico, Av. Rovisco Pais, 1096 Lisbon Codex, Portugal, Tel +351-1-8417372/8417378, Fax +351-1-8475545/ 7262633, Telex 63423 ISTUTL P

* IUTAM-Symposium on Advances in Nonlinear Stochastic Mechanics
Trondheim, NORWAY, July 3-7, 1995
Prof. S. Krenk, Dept. Building Technology, & Structural Engineering, Sohngaardsholmsvej 57,
DK-9000 Aalborg, Denmark, Fax +45-9-8148243, Prof. A. Naess, Dept. of Civil Engineering,
Norweigian Institute of Technology, Rich. Birkelands vei la N-7034 Trondheim, Norway

* 5th International Conference on Bulk Materials Storage, Handling and Transportation
Newcastle, AUSTRALIA, July 10-12, 1995
The Conference Manager, Newcastle Division, The Institution of Engineers, Australia,
P.O. Box 238C, Newcastle NSW 2300, Australia, Tel +61-49-26-4440, Fax +61-49-297-121

* 14th Multiphase Flow Symposium '95
Matsuyama, Ehime, JAPAN, July 13-14, 1995
Dr. O. Tanaka (chairman), Prof, K. Ayukawa, Department of Engineering, Faculty of Engineering,
Ehime University, Bunkyo, Matsuyama 790, Japan, Tel +81-899-24-7111 ext. 3635, Fax +81-899-23-0672

* IUTAM-Symposium on Nonlinear Instability and Transition in Three-Dimensional Boundary Layers
Manchester, UK, July 17-20, 1995
Prof. P. Hall, Dept. of Mathematics, University of Manchester, Manchester M13 9PL, UK,
Prof. D I A. Poll, Dept. of Aeronautical Engineering, Simon Building, University of Manchester
Manchester M13 9PL, UK

* IUTAM-Symposium on Hydrodynamic Diffusion of Suspended Particles
Boulder, USA, July 23-25, 1995
Prof. H. Davis, University of Colorado, Boulder, CO 80309-0424, USA, Fax +1-303-492-4341

* 30th ASME/AIChE/ANS/AIAA, National Heat Transfer Conference
Portland, OR, USA, August 5-9, 1995
Dr. J. Welty, Tel +1-503-737-4902, Fax +1-503-737-2600

- A Session on Experimental Techniques in Two-Phase Flow (Two-Phase Flow and Instrumentation)
  (Abstracts due: October 24, 1994)
  Prof. G. Kojasoy, College of Engineering & Applied Science, Department of Mechanical Engineering, University of Wisconsin, Milwaukee, P.O.Box 784, Milwaukee, WI 53201, Tel +1-414-229-5639, Fax +1-414-229-6958, Dr. T. K. Larson, Idaho National Engineering Lab. P.O.Box 1625, M/S 2090, Idaho Falls, ID 83415, Tel +1-208-525-5334, Fax +1-208-525-5996, E-mail tkl@inel.gov

- A Session on Dynamic Phenomena and Instabilities in Two-Phase Flow
  (Abstracts due; October 20, 1994)
  Prof. M. Z. Podowski, Dept. of Nuclear Eng. & Eng. Phys., Rensselaer Polytechnic Institute, NES Bldg., Tibbitts Av., Troy, NY 12180-3590, USA, Tel +1-518-276-6110, Fax +1-518-276-4832, E-mail Podowm@rpi.edu, Dr. M. R. Fakory, S3 Technologies, 8930 Stanford Blvd., Columbia, MD 21045, USA, Tel +1-410-312-3594, Fax +1-410-312-3611

* Fluids Engineering Conference
Hilton Head, USA, August 13-16, 1995
Dr. E. P. Rood, Science Directorate/ONR, 800 N. Quincy Street, Arlington, VA 22217, USA

* Tenth Symposium on Turbulent Shear Flows
Pennsylvania, USA, August 14-16, 1995, (Abstracts due: November 15, 1994)
Prof. F. W. Schmidt, Secretary, Turbulent Shear Flows, Dept. of Mech. Eng., The Pennsylvania State Univ., University Park, PA 16802, USA, Tel +1-814-865-2072, Fax +1-814-863-4848

* 2nd Baltic Heat Transfer Conference
Riga, Jurmal, LATVIA, August 21-23, 1995
Prof. B. Sunden, Tel +46-46-108605, Fax +46-46-108612

* Seventh International Topical Meeting on Nuclear Reactor Thermal-Hydraulics (NURETH-7)
Saratoga Springs, NY, USA, September 10-15, 1995
Dr. R. T. Lahy, Jr. (General Chairman), Center for Multiphase Research, Rensselaer Polytechnic Institute, Troy, NY 12180-3590 USA, Tel +1-518-276-3040, Fax +1-518-276-3055, E-mail userfnwa@rpitsmts, Dr. M. Z. Podowski (Technical Program Chairman), Nuclear Engineering & Engineering Physics Dept., Rensselaer Polytechnic Institute, Troy, NY 12180-3590, USA, Tel +1-518-276-6110, Fax +1-518-276-3055, E-mail root@mikersc.ne.rpi.edu

* 8th International Symposium on Freight Pipelines
Pittsburgh, Pennsylvania USA, September 14-16, 1995, (Abstracts due: December 1, 1994)
Dr. George Klinzing (Symposium Chairman), University of Pittsburgh, PA 15261, USA,
Dr. Henry Liu, President, IFPS, Capsule Pipeline Research Center, College of Engineering, University of Missouri Columbia, MO 65211, FAX +1-314-884-4888.

* 3rd International Symposium on Coal Combustion (3rd ISCC)
Beijing, P.R.CHINA, September 18-21, 1995
Prof. Dr. Changhe Chen, Department of Thermal Engineering, Tsinghua University, Beijing 100084, P.R.China, Tel +86-861-2595701, Fax +86-861-2551224

* IUTAM-Symposium on Combustion in Supersonic Flows
Poitiers, FRANCE, October 2-6, 1995
Prof. M. Champion, Laboratoire d'Energétique et de Détonique, ENSMA, 20, Rue Guillaume VII, F-86034 Poitiers, France, Fax +33-49-605-044

* International Symposium on Two-Phase Flow Modelling and Experimentation
Rome, ITALY, October 9 - 11, 1995
(Full length manuscript due to the Lead Scientist: December 5, 1994)
Dr. G.P. Celata, ENEA Casaccia, Energy Department, Via Anguillarese, 301, I-00060 Rome, Italy, Fax +39-6-3048-3026

* 7th International Conference on Stirling Cycle Machines (ICSC '95)
Tokyo, JAPAN, November 5-8, 1995
Mr. Shigeji Tsukahara, 7th ICSC Japan '95 Secretariat, Director, Power and Energy Institute, Ministry of Transport, 6-38-1 Shinkawa, Mitaka, Tokyo 181, Japan, Tel +81-422-41-3086, Fax +81-422-41-3101

* 1995 ASME Winter Annual Meeting
San Francisco, CA, USA, November 12-17, 1995

- International Symposium on Turbomachinery Performance Deterioration
  (Abstracts due: December 1, 1994)
  Dr. W. Tabakoff, Dr. A. Hamed, Dept. of Aerospace Engineering & Engineering Mechanics, Univ. of Cincinnati, Cincinnati, OH 45221-0070, USA, Tel +1-513-556-3226, Fax +1-513-556-5038, Mr. D. B. Cale, Aviation Applied Technology, Directorate, Fort Eustis, VA 23604, USA, Tel +1-804-878-2771

- 1995 Symposium-Fluid Mechanics and Heart Transfer in Sprays/International Mechanical Engineering Congress
(Abstracts due: January 2, 1995)
Dr. J.W. Hoyt, San Diego State Univ., Tel +1-619-594-6067, Fax +1-619-594-6005, Dr. T.J. O'Hern, Sandia National Laboratories, Tel +1-505-844-9061, Fax +1-505-844-4523, E-mail, tiohern@sandia.gov., Dr. C. Presser, National Inst. of Sandards and Technology, Tel +1-301-975-2612, Fax +1-301-869-5924, Dr. R.L. Alpert, Factory Mutual Research Corp., Tel +1-617-255-4920, Fax +1-617-762-9375, Prof. A.K. Gupta, University of Maryland, Tel +1-301-405-5276, Fax +1-301-314-9477

- Symposium on Erosion Processes
(Abstracts due: December 1, 1994)
Dr. J.R. Kadambi, Chair, Organizing Committee, Department of Mechanical and Aerospace Engineering, Case Western Reserve University, Cleaveland, Ohaio 44106, USA, Tel +1-216-368-6456, Fax +1-216-368-6445, Dr. G. Ahmadi, Department of Mechanical and Aeronautical Engr., Box 5725, Clarkson University, Postdam, NY 13699, USA, Tel +1-315-268-2322, Fax +1-315-268-6438,
Dr. U.S. Rohatgi, 457B, Dept. of Nuclear Energy, Brookhaven National, National Laboratory, Upton, NY 11973, USA, Tel +1-516-282-2475, Fax +1-516-282-2613

- Symposium on Electrorheological Flows III
(Abstracts due: December 1, 1994)
Prof. D. A. Siginer, Dept. of Mech. Eng., 201 Ross Hall, Auburn University, Auburn, AL, USA, Tel +1-205-844-3331, Fax +1-205-844-3307, Dr. J. H. Kim, Elec. Power Res. Inst., 3412 Hillview Ave. P.O.Box 10412, Palo Alto, CA 94303, USA, Tel +1-415-855-2671, Fax +1-415-855-1026, Prof. G. S. Dulikravich, Dept. of Aero. Eng., Pennsylvania State Univ., 233 Hammond Bldg., University Park PA 16802, USA, Tel +1-814-863-0134, Fax +1-814-865-7092

* Twelfth Australasian Fluid Mechanics Conference (12 AFMC)
Sydney, AUSTRALIA, December 10-15, 1995, (Abstracts due: April 25, 1995)
12 AFMC Secretariat, Department of Mechanical and Mechatronic Engineering, University of Sydney, NSW 2006, Australia, Tel +61-2-692-2341, Fax +61-2-693-3760, Telex AA73460MICNAV, E-mail 12afmc@tiny.me.su.oz.au

* 2nd ISHMT-ASME Heat and Mass Transfer Conference, and 13th National Heat and Mass Transfer Conference
Surathakal, INDIA, December 28-30, 1995
Dr. B. T. Nijaguna, Tel +91-824-407322, Fax +91-824-476090

* Fifth Symposium on Multiphase Transport in Porous Media/ASME Winter Annual Meeting
Cicago, IL, USA, December, 1995, (Abstracts due: January 1, 1995)
Dr. R. R. Eaton, Sandia National Laboratories, Tel +1-505-844-4063, Fax +1-505-844-8251, Prof. K. S. Udell, University of California, Tel +1-510-642-2928, Prof. M. Kaviany, University of Michigan, Tel +1-313-936-0402, Prof. M. P. Sharma, University of Wyoming, Tel +1-307-766-6317, Prof. K. Vafai, Ohaio State University, Tel +1-614-292-6560

* 2nd European Thermal - Science and 14th UIT National Heat Transfer Conference
Rome, ITALY, May 27 - 31, 1996, (Abstracts due: April 4, 1995)
Dr. G.P. Celata, ENEA Casaccia, Energy Department, Via Anguillarese, 301, I-00060 Rome, Italy, Fax +39-6-3048-3026

* 8th International Symposium on Applications of Laser Techniques to Fluid Mechanics
Lisbon, PORTUGAL, July 8-11, 1996
LADOAN, 7-c/o Prof. M. V. Heitor, Dept. of Mechanical Engineering, Institute Superior Técnico Av. Rovisco Pais, P-1096 Lisbon Codex, Portugal, Tel +351-1-847-3453, Fax +351-1-849-6156

* Fifth World Congress of Chemical Engineering
San Diego, CA, USA, July 14-17, 1996
AIChE, Programming Department, 12th Floor, 345 East 47th Street, New York, NY 10017, USA, Tel +1-212-705-7373, Fax +1-212-752-3297

* The 19th International Congress on Theoretical and Applied Mechanics
Kyoto, JAPAN, August 25-31, 1996
Chairman: Prof. T. Tatsumi, Kyoto Institute of Technology, Matsugasaki, Sakyo-ku, Kyoto 606, Japan, Tel +81-75-724-7001, Fax +81-75-724-7000, Secretary: Prof. E. Watanabe, Dept. of Civil Engineering, Kyoto University, Sakyo-ku, Kyoto 606-01, Japan, Tel +81-75-753-5079, Fax +81-75-752-5296

* 4th World Conference on Experimental Heat Transfer, Fluid Mechanics and Thermodynamics
Brussels, BELGIUM, June 2-6, 1997
Prof. M. Gito, Tel +32-10-472200, Fax +32-10-452692, E-mail doyen@fsa.ucl.ac.be, Dr. R.K. Shah, Tel +1-716-439-3020, Fax +1-716-439-3648, E-mail RKSHAH@ACSU.BUFFALO.EDU

* 11th International Heat Transfer Conference
Seoul, KOREA, August 23-28, 1998
Prof. ST. Ro, Tel +82-2-880-7111, Fax +82-2-883-0179

Corresponding Members

CANADA

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A Note from the Editor

Members, who have paid the membership fee but did not sent 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 urgently.

The annual membership fee is ¥3,500 (Japanese yen) (¥1,000 for members of the Japan Society of Multiphase Flow (JSMF)); the Membership fee for 3 years is ¥10,000, if the fee is payed until the end of December, 1994.

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: ICeM, G. Matsui
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- ICeM will send the membership card and the receipt for the membership fee for those who pay the fee.
- The ICeM Newsletter is published twice a year and the next issue will be published in April 1995.
- Space may be bought in the Newsletter for advertisements. Please contact the Editor for details and rates.
- Any questions/comments are also welcome.

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.

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8th International Symposium on Freight Pipelines
Pittsburgh, Pennsylvania U.S.A.
September 14-16, 1995

Sponsoring Organisation: International Freight Pipeline Society (IFPS)
Host Institute: University of Pittsburgh, College of Engineering

CALL FOR PAPERS

Papers are invited in one or more than one of the following areas:

1. Slurry pipelines and slurry rheology
2. Capsule pipelines - both pneumatic and hydraulic capsule pipelines
3. Pneumatic pipelines (conveying)
4. New techniques in pipeline construction, operation, control and monitoring
5. Other important areas common to different types of pipelines.

Those interested in contributing a paper should send the PAPER TITLE and a ONE PAGE ABSTRACT to the Symposium Chairman Dr George Klinzing, University of Pittsburg, PA 15261, USA - DEADLINE : DECEMBER 1, 1994. Please provide a full mailing address, phone and fax numbers for correspondence.

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

CALL FOR PAPERS

SYMPOSIUM ON "ELECTRORHEOLOGICAL FLOWS III"
ASME International Mechanical Engineering Congress & Exposition
San Fransisco, California
November 12-17, 1995

The Fluid Mechanics and the Multiphase Flow Technical Committees of the Fluids Engineering Division of the ASME is sponsoring a Symposium on "Electrorheological Flows III" for the 1995 ASME International Mechanical Engineering Congress & Exposition.

The purpose of this Symposium is to provide an opportunity to report the latest results in the fast developing field of electrorheological fluids and flows. Fundamental issues such as constitutive formulation and instabilities as well as industrial applications of such fluids in shock absorbers, vibration dampers, acoustic modulators, robotic actuators, and active suspensions are included. Contributions emphasizing theoretical, numerical, and experimental aspects of electrorheological flows are solicited.

Papers will be peer reviewed. Prospective authors are requested to submit three copies of a one page abstract to the organizers by the deadline of December 1, 1994. Accepted papers will be published in a bound volume at the meeting.

DEADLINE SCHEDULE

Abstract due:	December 1, 1994
Abstract acceptance notification:	January 9, 1995
Draft papers due to organizers:	March 7, 1995
Author Notification/Matts:	May 8, 1995
Matts due to organizers:	July 11, 1995

The American Society of Mechanical Engineers

CALL FOR PAPERS

1995 SYMPOSIUM - FLUID MECHANICS AND HEAT TRANSFER IN SPRAYS

INTERNATIONAL MECHANICAL ENGINEERING CONGRESS

ASME WINTER ANNUAL MEETING
November 12 - 17, 1995 - San Francisco, California USA

Sponsored By:

Multiphase Flow Technical Committee, Fluids Engineering Division

K-6 Heat Transfer in Energy Systems Committee and K-11 Heat Transfer in Fire and Combustion Systems Committee, Heat Transfer Division

Purpose and Scope

Spray technology appears in many modern industrial processes such as food preparation, as well as in combustion and surface coating applications. Continuing a successful series of symposia at the 1991 and 1993 Winter Annual Meetings, papers are solicited in all relevant aspects of heat transfer and fluid mechanics of sprays, including, but not limited to:

Theoretical aspects of spray production
Spray combustion
Measurements of spray performance
Factors affecting heat transfer in sprays
Spray interaction with fires
Applications of spray technology
Non-Newtonian fluid spray dynamics
Particulate sprays
Design aspects of spray nozzles
Spray interaction with pollutants
Droplet hydrodynamics and interactions

Send a 500-word abstract to one of the Symposium organizers by January 2, 1995; draft papers will be due for review on April 3, 1995, and final manuscripts on camera-ready mats will be required by August 1, 1995. A bound volume of the papers will be available at the Symposium; authors will be encouraged to submit their papers for Journal publication after the Symposium.

Announcement and Call for Papers

FIFTH SYMPOSIUM ON MULTIPHASE TRANSPORT IN POROUS MEDIA

ASME Winter Annual Meeting, Chicago, IL, USA
December, 1995

Sponsored by Fluid Engineering Division (Multiphase Flow Committee) and Heat Transfer Division (Heat Transfer in Energy systems, K-6, and Theory/Fundamental Research, K-8, committees).

PURPOSE: The symposium will provide a forum for the presentation of information concerning mass transport and/or heat transfer phenomena encountered under conditions of multiphase flow in porous media. Experimental, theoretical, and numerical approaches to problems involving single-component (liquid-vapor) and multicomponent (liquid-gas or liquid-liquid) flows in porous media will be addressed.

SCOPE: Papers on fundamental aspects of multiphase-flow relevant to the following applications, are solicited:

-nuclear waste isolation in unsaturated geologic media
-heat transfer from cables/pipeline buried in unsaturated soils
-geothermal energy extraction
-enhanced oil recovery
-cooling of degraded nuclear core material
-multiphase flow through packed beds
-drying problems
-restoration of aquifers contaminated with nonaqueous phase liquids
-measurement techniques applied to these problem areas

SELECTION OF PAPERS: Prospective authors are requested to submit of a 500-word abstract, along with supporting figures and tables, which clearly state the objectives, results, and conclusions of their work. These abstracts will be used for preliminary paper selections. Final acceptance will be based upon peer reviews of completed papers. Accepted papers will be published in a symposium volume available at the conference.

DEADLINES	January 1, 1995	Abstracts Due* (4 copies)

2nd EUROPEAN THERMAL-SCIENCES AND 14th UIT NATIONAL HEAT TRANSFER CONFERENCE

May 29-31, 1996 • Rome, Italy

The First European Thermal-Sciences Conference was held in Birmingham, UK, jointly with the Third UK National Heat Transfer Conference, under the auspices of EUROTHERM. The program of the Conference included about 160 contributed papers and 4 invited lectures, and the Conference was attended by delegates from European and overseas countries. The Conference brought together scientists/engineers in thermal sciences and heat transfer, providing an open forum for the discussion of current and future research areas. EUROTHERM is organizing the Second European Thermal-Sciences Conference, jointly with the UIT (Italian Union of Thermo-fluid dynamics) National Heat Transfer Conference.

The objectives of the Conference are to bring together the international thermal science community. The researchers, designers, experimentalists, modellers, and numerical analysts in the area of thermal science and heat transfer have the opportunity to meet in a forum for high-level scientific and technical interchange of ideas, to stimulate discussion and liaison between specialists' groups, to exchange their expertise and experiences to further incite their research activities.

All participants will have an opportunity to become informed on latest developments in experimental, computational and theoretical work in the field of thermal sciences and heat transfer, as well as to take away from the Conference fresh ideas and new perspectives, a knowledge of new opportunities, and new contacts.

It is expected that this Conference will attract participants not only from Europe, but also from USA, Japan, Russian Federation and Eastern Countries, and other countries/regions of the world, and will include scientists/engineers from industry, government labs, academia, research organizations and consulting firms. Highly qualified experts in the field will present the keynote lectures.

Academic and industrial contributors are solicited to submit papers dealing with experimental work, new experimental techniques, theory, analysis, design, numerical studies, modelling on fundamentals, applications and technology of thermal sciences and heat transfer.

The Conference Scientific Committee is responsible for the approval and acceptance of papers and for the final Conference program.

DEADLINES

April 5, 1995	Four copies of abstract due to the Chairman of the Scientific Secretariat
June 15, 1995	Authors to be notified of abstract acceptance
October 20, 1995	Full-length paper due
January 15, 1996	Authors to be notified of paper acceptance
March 1, 1996	Author-prepared mats due

Chairman of the Scientific Committee: Prof. M. Cumo, University of Rome
Co-Chairman of the Scientific Committee: Prof. S. Faggiani, University of Pisa

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