

## CALL FOR PAPERS

## THIRD INTERNATIONAL SYMPOSIUM ON FLOW VISUALIZATION

Ann Arbor, Michigan, 6-9 September 1983

Papers are invited which deal with both methods and applications of flow visualization. Applications include combustion, heat transfer, fluid flows, fluid machinery, oceanography, rheology, biology, medicine, food technology, chemical engineering, geophysics, and terrestrial and planetary atmospheres.

Submission of one-page, single-spaced abstracts (3 copies) by 31 October 1982 (or 31 May 1982†)

Notification to authors of acceptance by 15 January 1983 (or 31 July 1982†)

Submission of final manuscripts by 15 April 1983

Abstracts should be submitted to:

*North and South America*

Prof. Wen-Jei Yang

Department of Mechanical Engineering and Applied Mechanics

The University of Michigan

Ann Arbor, MI 48109, U.S.A.

*Asia and Australia*

Prof. Y. Tanida

Institute of Interdisciplinary Research

University of Tokyo

Komaba, Meguro-Ku

Tokyo, Japan

*Western Europe and Africa*

Prof. W. Merzkirch

Institute für Thermo- und Fluidodynamik

Ruhr Universität Bochum

P.O. Box 102148

D-4630 Bochum 1

West Germany

*Eastern Europe and Middle East*

Prof. R. Reznicek

Institute of Mechanization

160 21 Prague 6, Suchbát

Czechoslovakia

General papers and invited lectures will be presented on 6-8 September and a one-day intensive course on "Optical Methods in Flow Visualization" will be offered on 9 September by Prof. W. Merzkirch and F. J. Weinberg (tentative).

*Program Committee*

Prof. T. Asanuma, Tokai University, Hiratsuka, Japan

Prof. K. C. Cheng, University of Alberta, Edmonton, Canada

Mr. J. P. Crowder, Boeing Aircraft, Seattle, U.S.A.

Prof. C. F. Dewey, Massachusetts Institute of Technology, Cambridge, U.S.A.

Prof. J. M. Dewey, University of Victoria, Victoria, Canada

Prof. W. Merzkirch, Ruhr-Universität Bochum, W. Germany

Prof. T. J. Mueller, University of Notre Dame, Notre Dame, U.S.A.

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Prof. R. H. Page, Texas A & M University, College Station, U.S.A.

Prof. R. Reznicek, Institute of Mechanization, Prague, CSSR

Dr. K. R. Saripalli, McDonnell Douglas, St. Louis, U.S.A.

Dr. G. S. Settles, Princeton University, Princeton, U.S.A.

Prof. Y. Tanida, University of Tokyo, Tokyo, Japan

Dr. C. Veret, O.N.E.R.A., Paris, France

Prof. F. J. Weinberg, Imperial College, London, U.K.

Prof. W. J. Yang (Chairman), University of Michigan, Ann Arbor, U.S.A.

† Authors from countries which need at least one-year time for approval of travel should submit their abstracts by this date.

*Planning Committee* (all at the University of Michigan):

Prof. Claus Borgnakke  
 Mr. George R. Carignan  
 Prof. John W. Keyes, Jr.  
 Prof. Charles M. Vest  
 Prof. Henry Y. N. Wang  
 Prof. Wen-Jei Yang

For further details contact

Prof. Wen-Jei Yang  
 Department of Mechanical Engineering and Applied Mechanics  
 The University of Michigan  
 Ann Arbor, MI 48109  
 U.S.A.

## FLOW VISUALIZATION TECHNIQUES, PRINCIPLES AND APPLICATIONS

Ann Arbor, Michigan, 16–18 August 1982 Fee: \$500

Chairman: Wen-Jei Yang

Like the methods of flow measurements, flow visualization techniques have been extensively applied in the experimental study of flow phenomena in combustion, fluid flow, heat and mass transfer, fluid machinery, rheology, biology, medicine, oceanography, food technology, chemical processes, geophysics, and terrestrial and planetary atmospheres. However, in contrast to flow measurements, which have attracted considerable attention, flow visualization techniques have never been organized for classroom presentation.

This intensive course is intended for engineers, scientists, and researchers in industry and government who want to acquire a working knowledge of the most widely used methods of visualizing flows. Emphasis is placed on the physical principles and application of surface tracing, tuft, tracer, and optical methods.

The course includes a review of recent pertinent literature and new information on digital image processing and computer tomography.

### *Prerequisite*

Participants should have a degree in engineering, science, or the equivalent experience.

### *Instructional program*

A complete set of lecture notes for the course will be given to each attendee at registration in Ann Arbor. The notes supplement the six hours of lecture presented each day.

### *Course content*

*Direct injection methods.* To visualize the velocity field from the motion or trace of observable foreign materials such as smoke, vapor, dye, particles and luminescence; selection of materials.

*Surface tracing methods.* To observe surface flow patterns using oil film, oil dot, sublimation, thermosensible paint, soluble chemical film and electrolytic etching.

*Tuft methods.* Use of surface tuft, depth tuft, tuft grid for visualizing the flow direction near a solid surface.

*Chemical reaction methods.* Interfacial reaction between reactants and electrolytic colouration by means of electrolysis.

*Electrical control methods.* Including hydrogen bubble, spark tracer and smoke wire techniques.

*Optics of inhomogeneous fluids.* Geometric optics, refraction and properties.

*Atomic optics.* Light-matter interaction and lasers.

*Overview of optical methods.* Interferometry, schlieren, shadowgraph, etc.

### *Holographic methods*

*Qualitative analysis.* Infringe analysis, computer tomography, digital image processing.

### *Specialized Methods in Optical Diagnostics*

*Applications.* Rheology, biomedicine, heat exchangers, fluid machinery, combustion, boundary-layer phenomena, oceanography, atmospheres, etc.