

## ANNOUNCEMENTS

### BASES OF MULTIPHASE FLOW AND HEAT TRANSFER

#### A 5-DAY WORKSHOP

*Hosted by*

Department of Chemical and Nuclear Engineering and University Extension,  
The University of California, Santa Barbara, U.S.A.

*15-19 January 1990*

#### THE PROGRAM

Two-phase flow and boiling heat transfer continue to focus the attention of researchers and to frustrate and challenge the engineer in the chemical, nuclear, oil-and-gas, cryogenic and other industries. New data and information, ideas and hypotheses, and facts and erroneous theories continue to be produced.

The short course described here is patterned after similar courses offered for a number of years at Stanford University and more recently at the University of California—Santa Barbara and at ETH—Zurich. Its intent is to provide:

- A condensed and critical view of present knowledge including areas of uncertainty
- Transfer of knowledge from one area of application to another
- Sources of data and correlations
- System analysis and design philosophy and methods
- Limitations of modern codes will be pointed out

The course features:

- A program of coordinated lectures by experts in the field
- A complete set of lecture notes and copies of slides
- Movies to illustrate physical phenomena
- Limited enrolment.

#### *The lecturers*

**Sanjoy Banerjee**, Professor at the Department of Chemical and Nuclear Engineering, University of California, Santa Barbara, U.S.A. Also a Visiting Professor at the Swiss Federal Institute of Technology in Zurich (ETHZ).

**Gad Hetsroni**, Danciger Professor of Engineering at Technion—Israel Institute of Technology. Currently, a Visiting Professor at the University of California, Santa Barbara, U.S.A.

**Geoffrey F. Hewitt**, Head of the Thermal Hydraulics Division at the Harwell Laboratory and Professor of Chemical Engineering at the Imperial College of Science and Technology, London, England.

**George Yadigaroglu**, Professor of Nuclear Engineering at the Swiss Federal Institute of Technology in Zurich (ETHZ) and head of the Thermal-Hydraulics Laboratory at the Paul-Scherrer Institute (formerly EIR), Switzerland.

#### *Course lectures*

##### **Monday 15 January**

1. Introduction
2. Basic equations I
3. Flow regimes
4. Measurement and correlation of void fractions

##### **Tuesday 16 January**

5. Measurement and correlation of pressure gradient
6. Two-phase flow in vertical pipes
7. Two-phase flow in horizontal and inclined pipes
8. Basic equations II

**Wednesday 17 January**

9. Two-phase heat transfer I
10. Two-phase heat transfer II
11. Closure relationships
12. Numerical methods

**Thursday 18 January**

13. Flow limiting phenomena
14. Scaling and natural circulation
15. Release behavior and dispersion
16. Instabilities
17. Condensation phenomena and modelling

**Friday 19 January**

18. Multicomponent systems
19. Vapor explosion
20. Microgravity phenomena

**HOTEL INFORMATION**

Participants may stay at the Sheraton Santa Barbara at a special room rate of \$79/89/night. Please contact the hotel directly [*Tel:* (805) 963-0744 or *FAX:* (805) 962-0985] and mention the workshop.

**REGISTRATION INFORMATION**

Registration is requested by **10 December 1989**. To request space after this date call (805) 961-4993 or 961-3200. No refunds will be granted after this date unless the workshop is cancelled. To secure registration, send registration form plus payment prior to **10 December**.

**WORKSHOP FEES**

Registration fees are \$1100(U.S.) and include lectures notes, copies of all slide notes, reception and workshop banquet. The lectures will be conducted at the Sheraton. Because of space limitations, participants are urged to register well before the deadline.

**FOR FURTHER INFORMATION CALL  
PROFESSOR G. HETSRONI  
on (805) 961-4993 or 961-3200**

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**SHORT COURSES**

on

**MULTIPHASE FLOW AND HEAT TRANSFER: BASES  
AND APPLICATIONS IN (A) THE NUCLEAR POWER  
INDUSTRY AND (B) THE PROCESS INDUSTRIES**

*Hosted by*

Swiss Federal Institute of Technology (ETH), Zurich, Switzerland

*19-23 March 1990*

The modular courses feature coordinated, comprehensive series of lectures by experts and are of interest to practising engineers and to researchers who wish to obtain a condensed and critical view of present basic knowledge (Part I) or information on the state-of-the-art regarding applications in specialized industries (Parts IIA and IIB).