

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**

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).

The courses aim at an interdisciplinary transfer of knowledge. Applications cover nuclear and chemical plant safety, steam generators, pipelines, etc.

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.

Contents of lectures

Part I. Bases

1. Introduction
2. Basic equations I
3. Flow regimes
4. Measurement and correlation of void fractions
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
9. Two-phase heat transfer I
10. Two-phase heat transfer II
11. Closure relationships
12. Numerical methods

Part II.A. Water Reactor Applications

- 13A. Steady-state operation
- 14A. Large break LOCAs
- 15A. Small break LOCAs
- 16A. Codes for transient and accident analysis
- 17A. Severe accidents
- 18A. Steam generators

Part II.B. Process and Petroleum Industry Applications

- 13B. Multicomponent heat and mass transfer
- 14B. Emergency relief system vent sizing
- 15B. Process boilers and condensers
- 16B. Relief ducting and treatment
- 17B. Pipelines
- 18B. Dense gas and mist dispersions

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