

The themes of the conference are:

- Thermofluidynamics of single and multi-phase systems.
- Thermofluidynamics of nuclear plants and environmental systems.
- Experimental methods and innovative technologies in thermal exchange.

Submissions are welcome by authors from any country. Authors wishing to present a paper should submit two copies of an extended abstract, typewritten in Italian or English. These should be sent to:

Professor Sergio Faggiani
 Dipartimento di Energetica
 Facoltà di Ingegneria
 Via Diotisalvi, 2
 56126 Pisa
 Italy
 Tel. 0039 50 554128
 Fax 0039 50 500987
 0039 50 585265

The extended abstract of about 400 words must specify the aim of the research, the theoretical and/or experimental methods employed, original findings and a concise comparison with previous results. Authors of abstracts considered appropriate for the conference will be informed by **1 March 1991** and invited to send the final paper. These should reach Professor S. Faggiani by **15 April 1991**. All papers, excepting those which do not correspond to the extended abstracts, will be published in the conference proceedings.

TWO-PHASE GAS-LIQUID FLOW SHORT COURSE: PRINCIPLES FOR MODELLING GAS-LIQUID FLOW

Department of Chemical Engineering, University of Houston,
 Houston, TX 77004, U.S.A.

22-26 July 1991

Description

The basic framework for modelling a wide variety of gas-liquid flow problems is now well-understood, much having been completed in recent years. This course will present this modern approach in sufficient detail so that those attending can apply the results to problems of design. In addition, this should prepare the participant to understand the new literature which emerges in the years to come.

This method first predicts the flow pattern. Then for each pattern, the flow behavior is modelled. Once this is done the modelling is extended to solve problems of heat and mass transport. Reliable data is important to an understanding of the mechanisms of two-phase flow. For this reason the course reviews some modern measuring methods as well as recent data.

The extensive facilities of the two-phase flow research laboratory will be made available to participants. Demonstrations will be conducted in the two-phase flow loops and special instrumentation techniques will be shown with hands on experiments. Interaction with the research team will be possible. Problem sessions are included in which the ideas developed in the course are applied to design. Extensive course notes and references on all materials presented will be provided.

Lecturers

A. E. Dukler: Ph.D. (Delaware) Professor of Chemical Engineering, University of Houston, Texas, U.S.A.

Y. Taitel: Ph.D. (Delaware) Professor, Department of Fluid Mechanics and Heat Transfer, Tel-Aviv University, Tel Aviv, Israel.

Course Outline

Monday 22 July—Introductory Concepts

- Occurrence and application of gas-liquid flow
- Effects of two-phase flow on transport
- The role of flow patterns
- Connections with older published methods
- Two-phase flow at zero gravity

Tuesday 23 July—Modelling Flow Pattern Transitions

- Horizontal and vertical pipes
- Effect of Inclination
- Upward and Downward Flows
- Transient Effects
- Boiling/Condensation Effects
- Tube Bundles
- Transitions at Zero Gravity

Wednesday 24 July

Modelling Stratified Flows

- Holdup, pressure drop, heat transfer

Modelling Horizontal Slug Flows

- Hydrodynamics, frequency, heat transfer

Modelling Annular Flows

- Falling and rising films (hydrodynamics, heat transfer)
- Wave motion
- Interfacial shear and friction

Thursday 25 July—Modelling Flow and Heat Transfer at 1 g in Vertical Tubes and at 0 g

- Bubble flow
- Annular flow
- Natural slug flow
- Modelling for zero gravity flows
- Terrain induced slugging
- Transient flows: the two-fluid and the drift flux models

Friday 26 July—Modern Measuring Methods

- Flow pattern detection
- Drop and bubble size and velocity
- Film thickness and wave structure
- Heat transfer parameters

Arrangements

The course fee is US\$800.00, including notes, coffee and a class dinner. Limited accommodation is available at the University of Houston Hotel and at area motels and hotels.

Checks should be made payable to University of Houston TPF Course, and should be sent with your reservation to:

Mrs Pat Cooks
Department of Chemical Engineering
University of Houston
Houston, TX 77204-4792, U.S.A.

The last day for reserving space on the course is **22 June 1991**.