

- 16A. Severe accident codes
- 17A. Steam generators
- 18A. Vapor explosions

Part IIB. Process and Petroleum Industry Applications (1½ days)

- 13B. Two-phase flow in pipelines
- 14B. Emergency relief system vent sizing
- 15B. Oil/water/gas flows: characteristics and measurement
- 16B. Dense gas and mist dispersions
- 17B. Transient multiphase multicomponent releases
- 18B. Fires and explosions

For further information contact:

Professor G. Yadigaroglu
ETH-Zentrum, CLT
8092 Zurich, Switzerland
Tel.: (41-1) 256.4615
Fax: (41-1) 262.2158

ADVANCED STUDY INSTITUTE

on

UNSTEADY COMBUSTION

Praia da Granja, Espinho, Portugal

6–17 September 1993

Objectives

To communicate information on the relative merits of forms of unsteady combustion with emphasis on practical applications, such as industrial burning equipments, ramjets and internal combustion engines, and to provide a forum for the discussion of new ideas and their application to the design of advanced combustion systems. Attention will be placed on the requirements for the development of low-emission equipments and the use of experimental and computational techniques to achieve this objective.

Organizing committee

F. E. Culick, California Institute of Technology, 201 Karman Laboratory, Mail Stop 301-45, Pasadena, CA 91125, U.S.A.

M. V. Heitor, *Director*, Instituto Superior Técnico, Department of Mechanical Engineering, Av. Rovisco Pais, 1096 Lisboa Codex, Portugal.

J. H. Whitelaw, Imperial College of Science, Technology and Medicine, Department of Mechanical Engineering, Exhibition Road, London SW7 2BX, England.

Programme

1st week

- Fundamentals of unsteady combustion
- Modern diagnostics for combustions flows
- Current scenario and future trends in the modelling of combustions flows
- Unsteady combustion devices
- Enhanced heat and mass transfer
- Environmental applications
- Gas turbine combustion and the performance of augmentators

2nd week

- Advanced laser diagnostics for scalar and velocity characteristics
- Whole field velocimetry for engine flows
- Experiments in two-phase unsteady combusting flows
- Periodic flows
- Internal combustion engines
- Engine-flow measurements and modelling.

Panel discussions, poster sessions and brief presentations of **research papers** will be arranged in addition to the formal lectures to allow the participants to describe their experience with modern measuring and computational techniques and, hence, the course will provide a platform for exchange of ideas among scientists involved in the development and use of modern techniques for the analysis of advanced combustion methods.

Poster and paper sessions

Poster and papers are accepted considering theoretical, experimental and computational research topics in the following areas:

- Advanced combustion methods
- Operation, control and modelling of unsteady combustors
- Combustion-induced oscillations
- Gas turbine combustion and the performance or argumentators
- Internal combustion engines
- New instrumentation for combusting flows
- CFD for combusting and engine flows.

Lecturers and participants of the institute are invited to present posters and papers. Poster and paper selection will be based upon reviewed abstracts of no less than 300 words which should be typed double-spaced and state the purpose, results and conclusions of the work with supporting figures as appropriate. Three copies of the abstract should be submitted to Professor M. V. Heitor.

Deadlines: Final date of receipt of abstracts and application form—**28 February 1993**; authors informed concerning acceptance—20 March 1993.

Proceedings

The content of all lectures together with the papers presented during the poster sessions will be published in a proceedings volume, which will be distributed to the participants of the institute.

The material of the principal lectures of the institute and selected papers will be published afterwards as a book in the *NATO/ASI Series* by Kluwer Academic Publishers.

General information

The participants, limited to 90, will include scientists, engineers, research associates and senior graduate students. A limited number of subsistence grants will be available to participants who belong to higher education institutions or other non-profit organizations in NATO countries.

Full details regarding grants, accommodation etc. are available from Professor M. V. Heitor.

Registration

The registration fee is US\$600.

Applications, a short Curriculum Vitae and a deposit of US\$200 should be sent no later than **28 February 1993** to:

Professor M. V. Heitor
 INSTITUTO SUPERIOR TÉCNICO
 Department of Mechanical Engineering
 Av. Rovisco Pais, 1096 Lisboa Codex, Portugal
 Tel.: 351-1-847 34 53/4
 Telex: 63423 ISTLUTL
 Fax: 351-1-849 61 56

Participants not awarded with a grant should send the balance of the registration fee (US\$400) by 31 June 1993.

Accommodation

The institute will be held in the *Hotel Solverde*, a 5-star hotel, located in the north of Portugal which is equipped with large and comfortable conference facilities and an efficient communication and information system. Right at the edge of the Atlantic Ocean, on the cosmopolitan *Praia da Granja*, *Hotel Solverde* is a mere 800 m from the Casino de Espinho, 20 minutes from Oporto and approximately 30 km from Oporto International Airport.

Participants and their guest will be invited to use the hotel sport facilities (swimming pools, health club, tennis courts, squash courts etc). The prices, including bed and breakfast for 13 nights, are as follows:

Single occupancy—US\$1100

Double occupancy, per person—US\$850.