#### REFERENCES

- 1. M. A. Biot, Variational Principles in Heat Transfer, Oxford University Press, London, 1970.
- M. A. Biot, 'Lagrangian thermodynamics of heat transfer in systems including fluid motion', J. Aero. Science, 29, 508-577 (1962).
- 3. G. A. Keramidas and E. C. Ting, 'A finite element formulation for thermal stress analysis, Part I: variational formulation', *Nuclear Eng. and Design*, **39**, 277–283 (1976).
- 4. G. A. Keramidas and E. C. Ting, 'A finite element formulation for thermal stress analysis Part II: finite element formulation', *Nuclear Eng. and Design*, **39**, 267–275 (1976).
- G. A. Keramidas and E. C. Ting, 'Variational formulations for heat conduction problems', J. Appl. Physics, 50, (2), (1979).

- 6. G. A. Keramidas, 'Finite elements for the heat conduction equation with temperature dependent coefficients', J. Mathematics and Computers in Simulation, 22, 248-255 (1980).
- 7. G. A. Keramidas, 'Finite element modeling for convection-diffusion problems, *NRL Memorandum Report* 4225 (1980).
- 8. G. A. Keramidas, 'Variational analysis and approximate solution for transport phenomena', NRL Memorandum Report 4852 (1982).
- 9. B. A. Finlayson, The Method of Weighted Residuals and Variational Principles, Academic Press, New York, 1972.
- 10. B. A. Finlayson and L. E. Scriven, 'On the search for variational principles', Int. J. Heat Mass Transfer, 10, 799-821 (1967).

# ANNOUNCEMENTS

# INTERNATIONAL CONFERENCE ON NUMERICAL METHODS IN LAMINAR AND TURBULENT FLOW

## The University of Washington, Seattle, U.S.A. 8–11 August 1983

#### **Objectives**

The objectives of this conference are similar to those of the first held in Swansea, 1978, and the second, held at Venice, 1981. Again the main objective is to consolidate the recent advances in the application of numerical techniques, particularly finite difference and finite element methods, to solve laminar and turbulent flow problems. Both techniques have received considerable attention in recent years and their application and development is continually expanding. It is hoped that the conference will provide a forum for numerical analysts to present new numerical methods and applications and experimentalists to present a comparison between measured quantities and calculated values using standard numerical techniques. The subject matter should be of interest to both researchers and industry.

Provisional session headings Laminar Flow Lubrication Turbulent Flow Boundary Layers Flow with Separation Estuary and Coastline Hydrodynamics Flow in Rivers and Channels Turbo Machinery Meteorology Reactor Technology Free and Forced Convection Coupled Conduction and Convection Turbulent Heat Transfer Explosions Scientific and Industrial Applications

Requests for further information should be addressed to

Dr. C. TAYLOR, Department of Civil Engineering, University College of Swansea, Singleton Park, SWANSEA SA2 8PP, U.K.

# INTERNATIONAL CONFERENCE ON NUMERICAL METHODS IN THERMAL PROBLEMS

The University of Washington, Seattle, U.S.A. 2–5 August 1983

#### **Objectives**

The objectives of this conference are to consolidate the advances made in the numerical modelling of thermal problems which were presented at Swansea in 1979 and at Venice in 1981. The use of numerical techniques, such as the finite element and finite difference methods, is essential for solving problems of extreme complexity or difficult mathematical representations, which can occur in a wide range of disciplines.

It is expected that this conference will continue the unifying theme of the previous conferences in bringing together engineers and scientists to discuss thermal problems from a diverse spectrum of disciplines and ultimately produce a text on the latest 'state of the art'. Keynote speakers will present lectures on the diverse nature of the problems and the similarities of the solution techniques used would be emphasized.

A provisional list of possible areas of interest is as follows: Heat Conduction Phase Change Heat and Mass Transfer in Porous Bodies Geothermal Reservoir Simulation Thermal and Drying Stresses Industrial and Scientific Applications Solar Energy Turbulent Heat Transfer Fire and Combustion Simulation Coupled Conduction and Convection Mathematical and Computational Techniques Free and Forced Convection Nuclear Waste Disposal

#### Correspondence

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### MAFELAP 1984

### Conference on

# THE MATHEMATICS OF FINITE ELEMENTS AND APPLICATIONS Brunel University, 1–4 May 1984

Following the four previous Brunel conferences on The Mathematics of Finite Elements and Applications, a fifth residential conference with the same title will be run at Brunel University at the beginning of May 1984. The aim will be to bring together again workers from different disciplines whose common interest is finite element methods. The programme will consist of invited lectures, contributed papers and poster sessions. Topics

- The Mathematical Theory of Finite Elements Engineering and Scientific Applications of Finite Elements
- Computational Techniques for the Implementation of Finite Element Methods
- Boundary Element Methods and Their Application
- The Finite Element/Computer Aided Geometric Design Interface.

### Call for papers

A limited number of contributed papers and papers for poster sessions will be accepted for the conference. Persons wishing to read a contributed paper or to have a paper in a poster session should submit abstracts of not more than two pages in length by the 31 October 1983, indicating the mode of presentation that they would prefer.

#### Details

Persons wishing further details or submitting abstracts should write to:

The Secretary

The Institute of Computational Mathematics

Brunel University

Uxbridge, Middlesex, UB8 3PH, United Kingdom.