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Carlos Brebbia

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Heat Transfer X

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Lund University, Sweden

C. A. Brebbia

Wessex Institute of Technology, UK

WITPRESS Southampton, Boston



B. Sundén

Lund University, Sweden

C.A. Brebbia

Wessex Institute of Technology, UK

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Preface

Research and developments of computational methods for solving and understanding heat transfer problems continue to be important because heat transfer topics are commonly of a complex nature and different mechanisms like heat conduction, convection, turbulence, thermal radiation and phase change may occur simultaneously. Typically, applications are found in heat exchangers, gas turbine cooling, turbulent combustion and fires, electronics cooling, melting and solidification etc. Heat transfer might be regarded as an established and mature scientific discipline, but it has played a major role in new application fields such as sustainable development and reduction of greenhouse gases as well as for micro- and nanoscale structures and bio-engineering. Non-linear phenomena other than momentum transfer may occur due to temperature-dependent thermophysical properties. In engineering design and development, reliable and accurate computational methods are requested to replace or complement expensive and time consuming experimental trial and error work. Tremendous advancements have been achieved during recent years due to improved numerical solutions of non-linear partial differential equations and computer developments to achieve efficient and rapid calculations. Nevertheless, to further progress in computational methods will require developments in theoretical and predictive procedures – both basic and innovative – and in applied research. Accurate experimental investigations are needed to validate the numerical calculations.

Many of the research topics were discussed during the Tenth International Conference on Advanced Computational Methods and Experimental Measurements in Heat Transfer held in Maribor, Slovenia in July 2008. The objective of this conference series is to provide a forum for presentation and discussion of advanced topics, new approaches and application of advanced computational methods and experimental measurements to heat and mass transfer problems. This book contains the edited versions of the papers presented at the Conference. All papers have been reproduced from material submitted by the authors but an attempt has been made to use a unified outline and presentation for each paper.

The editors would like to thank all the distinguished and well-known scientists

who supported our efforts by serving on the International Scientific Advisory Committee, reviewing the submitted abstracts and papers. The excellent administrative work of the conference secretariat at WIT is greatly appreciated and the efficient co-operation and encouragement by the staff at WIT Press contributed significantly in producing this excellent conference book.

Bengt Sundén and Carlos Brebbia
Maribor, 2008

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