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**in**  
**Heat Transfer XI**

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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, fuel cells, micro- and minichannels, 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 emerging areas such as sustainable development and reduction of greenhouse gases as well as for micro- and nano-scale 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, turbulence modeling and computer developments to achieve efficient and rapid calculations. Nevertheless, 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 relevant research topics were discussed during the Eleventh International Conference on Advanced Computational Methods and Experimental Measurements in Heat Transfer and Mass Transfer held in Tallinn, Estonia in 2010. The objective of this conference series is to provide a forum for presentation and discussion of innovative research, new approaches and application of advanced computational methods and experimental measurements to heat and mass transfer problems. This book contains the edited versions of most of the papers presented at the Conference.

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 were essential in producing this book.

Bengt Sundén and Carlos Brebbia

*Tallinn, 2010*

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