Preface

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This special issue of the *Flow, Turbulence and Combustion* journal is dedicated to the recent developments in the research of turbulence-related heat and mass transfer. It reflects the trends, advancements and innovations, inspired and made possible by the growing potential of novel experimental and modelling techniques and numerical simulations, which have been unveiling ever new prospects for gaining deeper insight into turbulence structure, its dynamics and interactions. The volume covers various issues in single-phase, multi-phase and reacting/combusting flows, all focussing on the key role of turbulence in convective transport and mixing processes.

The papers originated from the 7th International Symposium on Turbulence, Heat and Mass Transfer held from September 24 to 27, 2012, at the University of Palermo in Italy. Since 1994 this triennial event has been providing a forum for scientists and engineers from industry and academia for presenting the state-of-the-art, recent advances and future prospects in the research of turbulence role in heat and mass transfer. The articles are grouped by subjects, beginning with a review and a series of papers on particle transport, mixing, agglomeration, heat transfer, and their modelling. The second group of papers deal with varied aspects of numerical simulation of combustion and flames primarily of gaseous fuels, but also of pulverized coal. These are followed by articles on miscellaneous topics that include electrically conducting fluids, a novel contactless flow rate measurement

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device, a new view of Langmuir circulation, and a computational re-examination of the Flettner-Thom rotors for maritime propulsion. The remaining articles report on experimental and numerical studies of various fundamental and applied aspects in single-phase flow, closed with a new approach to wall-modelled LES using a high-order spectral differencing scheme for unstructured meshes.

Authors of the selected presentations were encouraged to submit fully-fledged manuscripts with a comprehensive coverage of their research topics. Each manuscript has been subjected to a rigorous review in accord with the regular journal review procedure. The Editors would like to thank the authors and reviewers for their timely response and efforts to make this special journal issue a valuable contribution to the archival literature in the field of turbulence-related heat and mass transfer.