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Preface

Special Issue on Recent Advances in Turbulence, Heat and Mass Transfer

Kemo Hanjalić[1] · Michael Reeks[2] · Luc Vervisch[3]

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Turbulence plays an essential role in convective heat and mass transfer in non-reacting and reacting, single- and multi-phase fluid flows encountered in many branches of engineering and in the environment. Although posing varied challenges on their own, heat and mass transfer phenomena are inseparable from momentum transport, driven by turbulence, but also feeding back into the flow dynamics. These multiple-facetted interactions, some still awaiting full understanding, continue to be subjects of research worldwide, based on a synergy between massive numerical simulations and ever more illuminating laser-based laboratory diagnostics. This issue of Flow, Turbulence and Combustion aspires to highlight recent progress, and to provide an archival record of some of the current trends and achievements in this research field.

The issue contains 15 articles, based on the presentations at the 8th International Symposium on Turbulence, Heat and Mass Transfer, held in Sarajevo, Bosnia and Herzegovina in the period September 18-23, 2015. This triennial event, initiated in 1994, continues to provide a forum for scientists and engineers from academe and industry to present and discuss recent advances and future prospects in research on the role of turbulence in heat and mass transfer. Every paper was subjected to the same rigorous review scrutiny as practiced

✉ Kemo Hanjalić
k.hanjalic@tudelft.nl

Michael Reeks
mike.reeks@ncl.ac.uk

Luc Vervisch
vervisch@coria.fr

[1] TU Delft / Faculty Applied Sciences, Transport Phenomena, Building 58, Van der Maasweg 9, 2629 HZ Delft, The Netherlands

[2] School of Mechanical and Systems Engineering, Newcastle University, T2A Stephenson Building, Newcastle NE1 7RU, UK

[3] INSA de Rouen CNRS–UMR 6614, Avenue de l'Université, Campus du Madrillet BP 8, FR-76801 Saint-Etienne du Rouvray, France

for all FTaC submissions. The articles cover a mix of topics, ranging from experimental and computational studies on turbulence structures in rotating, separating and combusting flows, and on a range of specific challenges in industrially-relevant flows and heat transfer. Several articles deal with drag, heat transfer and combustion control using jets and plasma actuators, while others consider some specific problems such as the interface interactions over porous and rough walls, gravity effects on fibre dynamics in wall turbulence and the effect of cloud microphysics on sea spray and air-sea heat transfer. Computer simulations of flames are also reported, with a focus on the evaluation of the LES subgrid-scale models for combustion and heat flux, and stabilization of gaseous and spray-flames. The last three articles report URANS analyses of some practically relevant applications, which include flow control over a generic truck pillar, energy losses in hydroturbine draft tubes and effects of human thermoregulation on heat transfer in a generic car cabin.

The Editors wish to thank all authors and reviewers for their efforts towards making this Special Issue a valuable contribution to the archival literature on the turbulence and its role in heat and mass transfer.