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Preface

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Shear plays an essential role in generation and evolution of turbulence, in mixing and transport, both in non-reacting and reacting, single- and multi-phase fluid flows. Multiple facets of shear flow phenomena, some still awaiting proper understanding, continue to be in the focus of research worldwide, nowadays enlightened by synergy of massive numerical simulations and ever more insightful laser-based laboratory diagnostics. This issue of Flow, Turbulence and Combustion aims at highlighting the progress and providing an archival record of the current trends and achievements in this research field.

The issue contains 12 invited articles, selected from the presentations at the 8th International Symposium on Turbulence and Shear Flow Phenomena, held in Poitiers, France on August 28–30 2013. Each paper was subjected to the same rigorous review scrutiny by three referees, as practised for all FTaC submissions.

The first article, originating from the keynote lecture by Sebastian Candel, provides an overview of developments in modelling combustion chemistry in large-eddy simulation of

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turbulent flames. The subsequent seven papers deal with various actual issues of shear phenomena in non-reacting flows. The topics covered include, among others, the control of laminar-to-turbulent transition and high-speed jets, evaluation of wall pressure spectra and convection velocities in turbulent boundary layers, effect of wall roughness in separated flows, manipulating mixing layers, and hysteresis in a nonreacting model of a swirl burner. These are followed by four articles on reacting flows, which cover flame wrinkling in turbulent premixed combustion, quantification of pre-ignition front propagation in rapidly compressed mixture, flame dynamics during combustion instability in high-pressure coaxial combustor, and multi-scale turbulence generator in a high-pressure burner. It is indicative that, save for few that originated from the experiments, the majority of articles use the direct and even more the large-eddy simulations, DNS and LES, testifying that numerical simulations, complemented by sophisticated experiments, are emerging as the major research tool in studying turbulence and shear flow phenomena.

The Editors would like to thank all authors and reviewers for their efforts to make this special issue a valuable contribution to the archival literature on turbulence and shear flow phenomena.

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