Flow, Turbulence and Combustion
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PREFACE

Progress in Clean-Combustion Science and Technology

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1 Preface

This Special Issue reflects the scientific progress presented at the International Workshop on Clean Combustion: Principles and Applications held in Darmstadt, Germany, in the period September 25th–26th, 2019. The Workshop was organized within the framework of two Collaborative Research Centres, namely (1) Turbulent, Chemically Reactive, Multiphase Flows Near Walls, and (2) Oxy-flame—Development of Methods and Models to Describe Solid Fuel Reactions within an Oxy-fuel Atmosphere, both funded by the German Research Foundation (Deutsche Forschungsgemeinschaft—DFG). The workshop was held in honor of Professor Johannes Janicka, on the occasion of his retirement, to celebrate his seminal contributions to turbulent combustion science and modelling.

Topics in this Special Issue cover combustion principles and applications, as well as progress in theoretical, numerical and experimental techniques for describing and designing green-energy technologies. Also addressed are developments and advances in various engineering and process applications, exposing new research challenges. The topics include reciprocating internal combustion engines, gas turbines, exhaust-gas after-treatment systems in automotive technology, oxy-fuel and-solid fuel combustion. Within these areas of application, a wide range of physicochemical mechanisms and processes are investigated, among them: chemically reacting solid particles, spray-wall interaction, liquid film evaporation and deposition, film growth, flame-wall interaction and surface reactions including their coupling with chemically reacting flows.

The workshop offered an opportunity for researchers and interested practitioners to expose the state-of-the-art, discuss new challenges and developments, exchange innovative ideas, deepen existing collaborations and initiate new cooperation activities.

The editors named below hope that this Special Issue will be judged to be a milestone in the ongoing quest for "greening" combustion systems by reducing harmful emissions as close to zero as possible.

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