Special Issue

Measurement and Simulation of Atmospheric Emissions in the Era of Combustion Paradigm Shift

Message from the Guest Editors

This Special Issue investigates the complex and evolving landscape of atmospheric emissions in combustion systems undergoing a transition toward low-carbon and climate-oriented technologies. We welcome studies that combine advanced measurement techniques and computational modeling to characterize the formation, behavior, and transformation of pollutants across both conventional and emerging fuels, including ammonia, hydrogen-enriched mixtures, and synthetic alternatives. Special focus will be placed on the emergence of previously underrepresented or secondary pollutants, and their formation mechanisms under novel combustion conditions. The Special Issue encourages interdisciplinary approaches that integrate combustion chemistry, atmospheric modeling, and environmental risk assessment, highlighting how fuel innovation may introduce new atmospheric impacts beyond traditional carbon metrics. By bridging experimental diagnostics, field observations, and predictive simulations, this Special Issue aims to inform mitigation strategies, support regulatory development, and guide future research in sustainable combustion systems aligned with global climate goals.

Guest Editors

Dr. Václav Nevrlý
Dr. Hana Chaloupecká
Dr. Vojtech Jankuj

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Atmosphere
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
atmosphere@mdpi.com

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About the Journal

Message from the Editor-in-Chief

Continued developments in instrumentation and modeling have driven atmospheric science to become increasingly more complex with a deeper understanding of concepts, mechanisms, and interactions. This is the field that innovation built and it has led to a better appreciation for the complexity with atmosphere. Human life is intertwined in this complexity as we strive to better understand our atmosphere. Climate change is constantly stretching the limits of our thinking and forcing new ideas and concepts to be played out. Welcome to the Anthropocene!

Editor-in-Chief

Dr. Daniele Contini
Institute of Atmospheric Sciences and Climate (ISAC), National Research Council (CNR), Str. Prv. Lecce-Monteroni km 1.2, 73100 Lecce, Italy

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