

Special Issue

Combustion and Fluid Mechanics: Analysis, Research and Experimentation

Message from the Guest Editors

Combustion and fluid mechanics form the foundational backbone of energy conversion and propulsion systems, governing the complex interactions between reactive flows, heat transfer, and chemical kinetics across scales. As humanity advances toward sustainable energy goals, next-generation combustion technologies demand precise control over flame dynamics, emission reduction, and system efficiency—challenges that hinge on rigorous analytical modeling, cutting-edge numerical simulations, and well-designed experimental investigations. This Special Issue focuses on the interplay between combustion science and fluid mechanics, showcasing state-of-the-art research that bridges fundamental theory and practical engineering applications. Contributions cover a wide spectrum, from fundamental studies of turbulent reactive flows, flame instabilities, and deflagration-to-detonation transition, to advanced experimental techniques and computational frameworks for optimizing low-emission and high-efficiency combustion systems.

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