Special Issue

Combustion Prediction, Monitoring and Diagnostics

Message from the Guest Editors

The accurate modeling and simulation of combustion processes are essential for advancing our understanding of reactive flows, improving energy efficiency, and reducing emissions in practical systems. This Special Issue focuses on recent developments in computational frameworks, numerical simulations, and mathematical modeling techniques that support combustion diagnostics and monitoring. Emphasis is placed on models that enable real-time prediction, multi-scale analysis, and system-level integration for engines, gas turbines, solid propellants, and industrial burners. We welcome studies that demonstrate the synergy between simulations and experimental diagnostics—where experimental data inform model development, calibration, and validation. Topics include high-fidelity simulations of flame structure, pollutant formation, and transient phenomena, model reduction, uncertainty quantification, and data assimilation. Submissions incorporating machine learning, physics-informed models, or sensor-integrated simulations are encouraged.

Guest Editors

Dr. Mayank Khichar

1. State College, Pennsylvania State University, 201 Old Main, University Park, PA 16802, USA
2. Gamma Technologies LLC, 601 Oakmont Lane, Suite 220, Westmont, IL 60559, USA

Dr. Abhishek Jain

1. State College, Pennsylvania State University, 201 Old Main, University Park, PA 16802, USA
2. Gamma Technologies LLC, 601 Oakmont Lane, Suite 220, Westmont, IL 60559, USA

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

mdpi.com/journal/fire

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About the Journal

Message from the Editor-in-Chief

Fire is an international open-access journal about the science, policy, and technology of fires and how they interact with communities and the environment. *Fire* seeks to provide a forum to help the fire science community convey how we can live with fire in a changing world. *Fire* seeks submissions from interdisciplinary studies that take a pyrogeography perspective of fires occurring in natural, cultural, and industrial landscapes and how they interact with communities in the science-policy interface. *Fire*'s Editorial Board are widely recognized international leaders. The journal emphasizes quality and innovation and has a rigorous peer-review process. I strongly recommend *Fire* for the rapid publication of your innovative research publications and case studies.

Editor-in-Chief

Dr. Grant Williamson
School of Biological Sciences, University of Tasmania, Private Bag 55, Hobart, TAS 7001, Australia

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