

COMBUSTION WEBINAR

Multi-regime combustion - Towards integrated inference from numerical and real experiments

Speaker: Prof. Christian Hasse, STFS, TU Darmstadt

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**COMBUSTION
WEBINAR**



Biography: Prof. Hasse is head of the Institute for the Simulation of reactive Thermo-Fluid Systems (STFS: www.stfs.tu-darmstadt.de) at Darmstadt University of Technology (Technische Universität Darmstadt). From 2010-2017 he was full professor at the Technische Universität Bergakademie Freiberg. From 2004-2010 he worked at BMW in engine development and exhaust aftertreatment. He received his doctorate at RWTH Aachen University in 2004 (supervisor: Norbert Peters).

His main research interests are combustion theory, modeling and simulation with application to technical systems such as IC engines, aero-engines, furnaces and reactors in process engineering. He has published over 180 peer-reviewed papers. He was elected Fellow of the International Combustion Institute for his contributions to turbulent combustion, solid fuel combustion, multi-phase flows and soot formation.

Abstract: Multi-regime combustion can be found in many practical applications such as aero-engines, gas turbines or IC engines, where partial premixing of fuel and oxidizer, as well as recirculation of combustion products, lead to such complex combustion scenarios. To develop models for multi-regime combustion, experiments, theory and simulation must collaborate closely and it must be clarified how the experimental and numerical data can be combined (integrated inference) to understand the macroscopic and microscopic flame structure. This is discussed based on two key questions:

- (1) *What is the best method and what are the best measures for comparing experimental and numerical data?*
- (2) *What is the best way to use the experimental and numerical data to analyze the local combustion mode/regime?*

Finally, the integrated inference from numerical and experimental approaches for current examples of turbulent flames with increasing complexity is discussed.

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