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| **Flamelet modeling of laminar and turbulent thermo-diffusively unstable hydrogen-air flames** |

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**Abstract:**

Flamelet-based approaches are widely used for modeling of turbulent hydrocarbon flames. However, these models are not yet well explored for premixed hydrogen combustion. First flamelet-based models were developed for laminar hydrogen-air flames. Recent findings showed that flamelet models considering curvature effects give good predictions for laminar thermo-diffusively unstable flames concerning both the flame structure and mixture stratification resulting from differential diffusion effects. However, it remains unclear if these models are directly applicable to lean turbulent premixed hydrogen-air flames since these flames exhibit synergistic effects of turbulence and thermo-diffusive instabilities. Specifically, the influence of stretch on flame physics requires a more detailed assessment and implications for flamelet-based models need to be explored. The seminar includes an overall introduction to flamelet-based modeling highlighting the challenges concerning hydrogen combustion. Thereafter, the relevant physical phenomena of laminar and turbulent thermo-diffusively unstable hydrogen-air flames are assessed based on which novel flamelet-based models have been developed to better capture the flame physics.

**Brief Biography:**

Mr. Hannes Böttler holds a diploma degree (equivalent to M.S.) in Process Engineering from Technical University Bergakademie Freiberg (2019). During his studies he did a six-month research internship in 2017 at the Chemical Kinetics Laboratory at ELTE University in Budapest under the supervision of Prof. Tamás Turányi where he focused on butanol combustion. He started a PhD position at the Technical University of Darmstadt at the Institute for Simulation of reactive Thermo-Fluid Systems under the supervision of Prof. Christian Hasse in 2019. His research focuses on the flamelet modeling of premixed hydrogen-air flames, where he has authored several papers on igniting hydrogen-air flames and thermo-diffusively unstable hydrogen-air flames.

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**地点：北京大学 工学院 1#楼212会议室**

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