Position as postdoctoral research associate in the field of kinetic model development and quantum chemistry calculation for PAH chemistry and renewable fuels

Our Profile
The Institute for Combustion Technology (ITV) led by Prof. Dr.-Ing. Heinz Pitsch focuses on research in combustion and its applications in engines, gas turbines, and furnaces, chemical kinetics of combustion, turbulence theory, and multiphase flows. Our approach is the combination of simultaneous theoretical model development, numerical simulation, and experimental validation. A current research emphasis at ITV lies in the numerical and experimental investigation of polycyclic aromatic hydrocarbon (PAH) chemistry and soot formation from conventional, bio-based, and synthetic fuels. The formation mechanisms of PAHs are explored numerically through the development of detailed kinetic models and high-level quantum chemistry simulations. In different work, fundamental measurements of PAH species concentrations and soot volume fractions are performed in different setups, such as counterflow burners, and serve as model validation targets. The developed PAH mechanisms are coupled with the oxidation mechanisms of different fuels of interest, including surrogates of conventional fuels as well as alternative fuels, for instance, as part of the Cluster of Excellence “The Fuel Science Center”. The mechanisms are ultimately applied within ITV and by collaborators for computational fluid dynamics (CFD) simulations to explore soot formation in practical combustion environments and to optimize energy conversion devices.

Your Tasks
- Development of chemical kinetic models for PAH formation and fuel oxidation
- Quantum chemistry calculation of important rate coefficients and species thermochemistry data
- Development and application of methods and simulation frameworks for kinetic model analysis and development (sensitivity analysis, uncertainty quantification, optimization)
- Project management and interdisciplinary research (within ITV and with external collaborators & sponsors)
- Publication of research results in high-impact journals (Combustion and Flame, Proceedings of the Combustion Institute, etc.)
Your Profile:
- Ph.D. degree in Mechanical Engineering, Chemical Engineering, Chemistry or a related subject with a focus on combustion kinetics
- Strong background in quantum chemistry methods
- Experience in the development of chemical kinetic models of fuel combustion and/or PAH formation
- Excellent oral and written English communication skills, including a history of peer-reviewed publications in high-impact journals
- An efficient and independent work style
- Ability to work in an interdisciplinary team
- Willingness to take on responsibility, mentor Ph.D. students, and collaborate with project partners and sponsors

Our Offer:
- The hiring takes place in the employment relationship
- This is a full-time position
- The position is rated TV-L 13

RWTH is certified as a family-friendly university. We particularly want to promote the careers of women at RWTH Aachen University. In case of equivalent qualification, women will be preferred, provided that they are underrepresented in the organizational unit. Applications from severely disabled people are expressly welcome.

Contact Person:
Florian vom Lehn, M. Sc.
Email: f.vom.lehn@itv.rwth-aachen.de

Please address your application (including CV and all relevant transcripts) to
RWTH Aachen University
Institut für Technische Verbrennung
Templergraben 64
52062 Aachen
Email: jobs@itv.rwth-aachen.de