



DLR – DAAD Fellowships

Fellowship No. 493

Research Area : Energy

Research Topic: **Laser-based diagnostics to support combustor development**

DLR Institute: Institute of Combustion Technology, DLR Stuttgart

Position: Postdoctoral Fellow

Openings: 1

Job Specification: At the Institute of Combustion Technology located in Stuttgart, technical combustion processes are optimized by our 80 male and female scientists, who are specialized in different disciplines, applying numerical models, modern experimental equipment and methods of chemical reaction kinetics. In the department “Combustor Systems and Diagnostics” you work in an international team of about 15 scientists. Here, optical and laser-based diagnostics are developed, adapted, and applied to combustion phenomena on different scale, reaching from idealized small scale atmospheric to highly turbulent pressurized. The derived results are used to support the development of combustor design with input from CFD simulations of the process. The research focusses on improving the understanding of combustion, aiming at innovative gas turbine combustors, and prominently involves the fuel influence on combustion behavior and its sub-processes. Future requirements for sustainable use of resources and, specifically, use of alternative, bio-based gaseous or liquid fuels, or hydrogen, pose new challenges, for example in terms of flame stabilization and pollutant formations. To support future combustor development, the department employs modern laser-diagnostic equipment (PLIF, PIV, LII, Raman Scattering, CARS, Absorption Spectroscopy) and operates tailored laboratory burners and pressurized combustors according to the research requirements.

You have the following tasks:

- Application of laser-based diagnostics to combustion processes involving hydrogen and/or liquid alternative fuels, and preparation of the measurements

- Use and development of data evaluation tools
- Presentation of results on appropriate channels (workshops/conferences/journals)
- Adaptation of the diagnostics where required for the measurement task
- Interaction and intense collaboration with colleagues from the department, as well as regular exchange with colleagues from the neighboring departments to benefit from interfaces with technical application in micro gas turbines, computational fluid dynamics, or chemical/combustion analytics and kinetics
- Participation in transfer of results from optical diagnostics into combustor development

Required Qualification:

- PhD in physics or appropriate engineering discipline, for example Mechanical and Aerospace Engineering
- Solid experience in using laser-based diagnostics as PLIF, PIV, LII in challenging combustion ambience
- Data evaluation skills applied to imaging data
- Experience with technical combustion
- Skills in compilation of scientific results as demonstrated by appropriate publication list

Advantageous Skills:

- Experience with combustor design
- Background on different technically employed injector and flame stabilization principles
- Interest in interdisciplinary exchange
- Use to autonomous working ambience

English competence: See requirements on www.daad.de/dlr

Earliest Start Date: 01.09.2021 (if Covid situation allows)

Application Deadline: Until position is filled

Further Information: <http://www.dlr.de>
<http://www.daad.de/dlr>