

## Marie Skłodowska-Curie PostDoc Positions in Germany

### “Expression of Interest” for hosting Fellows

This template should be used by institutions interested in hosting postdoctoral fellows within the Marie Skłodowska-Curie Individual Fellowship programme. Host institutions should be located in Germany.

#### 1. Valid for the following MSCA-IF Calls<sup>1</sup>:

<input checked="" type="checkbox"/> 2019	<input type="checkbox"/> 2020
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#### 2. Interested host institution:

TU Bergakademie Freiberg Akademiestr. 6 09599 Freiberg  Name of EU liaison officer (EU-Referent/in), if applicable: Mrs. Dr. Ellen Weißmantel
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#### 3. Institute/Department:

Institute of Thermal Engineering Chair of Gas and Heat Technology Lampadius-Bau Gustav-Zeuner-Straße 7 D-09599 Freiberg  Website (Hyperlink): <a href="http://www.gwa.tu-freiberg.de">www.gwa.tu-freiberg.de</a>
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#### 4. Contact person (name and e-mail address):

Prof. Dr.-Ing. Hartmut Krause  Tel.: +49 3731 39 3940 Mail: <a href="mailto:Hartmut.krause@iwtt.tu-freiberg.de">Hartmut.krause@iwtt.tu-freiberg.de</a>
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<sup>1</sup> MSCA Individual Fellowships are selected on the basis of annual calls for proposals. Forthcoming and open calls for proposals can be found on the [Funding & tender opportunities Portal](#) of the European Commission.

## 5. Project idea/position (scientific requirements, topic, discipline):

Rough outline of idea/position:

The Chair of Gas and Heat Engineering (GWA) under the direction of Prof. Hartmut Krause focuses its research on the fields of gas engineering, combustion engineering, thermal process engineering and energy technology. In the working group combustion engineering the emphasis lies on basic research as well as innovative and application-oriented solutions for high temperature processes. In addition to fundamental investigations on model flames with optical and invasive measuring methods, special burners are also developed and designed. Hydrogen combustion has been one of the chairs main research areas for more than 8 years and several research and industrial projects have been successfully carried out. In the context of current research activities on the combustion of hydrogen, the influence on high-temperature materials is of increasing interest. This interests results from the increased feeding of hydrogen from renewable energy into the natural gas grid up to pure hydrogen. In some scenarios a complete system change by 2050 to a pure hydrogen gas grid segments is expected. This leads to a number of technical challenges are being addressed by the scientific community. The main tasks are targeted to well fitted flame forms, a homogeneous temperature distribution and to reduce possible pollutant formation to a minimum.

A current project idea focuses on the investigation of hydrogen flames using laser measurement techniques to study temperature and species profiles. Following preliminary investigations on turbulent model burners, the influence of recirculated exhaust gases will also be investigated. In addition, comparative simulation calculations are to be carried out for both model and technical flames.

Proposed topic for the Fellow:

- Development of a burner for optical investigations of turbulent model flames
- Numerical simulation of turbulent flames incl. validation of numerical models
- Upscaling and simulation of a 2-stage combustion chamber and measurements of a self-created test matrix for exhaust gas recirculation in hydrogen flames and mixtures

We would be happy to support and host a Marie Skłodowska Curie scholar who is highly talented, motivated and naturally interested in this research topic.

Scientific requirements (Fellow):

- Experience in the field of technical combustion
- Optional: Practical experience in laser diagnostics of gaseous matters (LIF, Raman, Rayleigh)
- Optional: Experience in numerical simulation and modelling of combustion processes (Chemkin and ANSYS are available)

Training opportunities we open up in addition to the given research field:

- Model burners (Heatflux, Counterflow, Güldner and Constant volume chamber)
- Furnaces and thermal process technology
- Applied thermodynamics
- Advanced simulation techniques
- Combustion engineering and natural sciences

Please tick:

- Life Sciences
- Natural Sciences
- X Engineering Sciences
- Social Sciences and Humanities

**6. Deadline<sup>2</sup> for considering interests by postdoctoral applicants:**

We do not have any detailed deadline. Interested postdoctoral applicants can contact us anytime. However, we ask that applicants contact us as early as possible in order to plan and support the project in the best possible way

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<sup>2</sup> Please consider that the preparation of a Marie Skłodowska-Curie proposal requires some time and that the fellow and supervisor have to agree on a project and training opportunities for the fellow.