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## DLR – DAAD Fellowships

Fellowship No. 645

- Research Area :** Aeronautics / Space
- Research Topic:** **Development of advanced sensor designs for Hydrogen detection based on nanostructured mixed metal oxides**
- DLR Institute:** Institute of Materials Research
- Location:** Cologne, Germany
- Position:** Senior Scientist
- Openings:** 1
- Job Specification:** The application of hydrogen as green fuel on combustion and energy supplier in fuel-cells is progressing, but is associated with new technological requirements in terms of safe and efficient storage systems. Thus, the development of highly sensitive surface-applicable H<sub>2</sub> sensors for continuous safety/leakage monitoring in mixed and inert gas environments is attracting great interest. Due to the crucial influence of material composition and morphologies on gas sensing performance, designed synthesis of semiconducting mixed metal oxides in various morphologies and their functionalization with acceptor elements is challenging and requires clever monitoring of process steps for development of highly sensitive and selective sensor devices. In the past years, the department of High-Temperature and Functional Coatings has conducted substantial research on the fabrication of gas sensing materials and development of sensor design. The generated knowledge and obtained experience need to be extended with the development of sensor materials and layers based on metal oxides to enable the production of advanced gas sensors for near-real time H<sub>2</sub> detection in different concentrations at room or low operating temperatures.
- Required Qualification:** This position requires a self-motivated and creative scientist with a highly-graded PhD degree in Inorganic Chemistry, Engineering Science with emphasis on solid-state chemistry and nanoscience technology and

electrical engineering, device physics, as well as on proven expertise in the sciences of gas sensing, gas sensor fabrication and testing and in synthesis and characterisation of nanostructured materials.

**Advantageous Skills:** Experience in fabrication of gas sensors and their electrochemical and sensing characterization (voltage-current dependencies, measuring resistance changes, potentiometric and impedance spectroscopy and equivalent circuit modelling), data analysis and interpretation. Previous knowledge and experience in materials preparation by wet-chemistry approaches (co-precipitation, sol-gel, etc.) and sputtering techniques (e.g. CVD, PVD) for gas sensing applications. Skills in characterization of the microstructural properties and phase composition of powders and coatings (XRD, SEM, EDX) as well as new material formulations/functionalization.

**English competence:** See requirements on [www.daad.de/dlr](http://www.daad.de/dlr)

**Earliest Start Date:** July 2024

**Application Deadline:** Until position filled

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

**More information may be obtained by contacting:**

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Thank you for your attention!

We look forward to receiving your application!