

## Job posting

### Type of position

  

scientific  
administrative

### Target group

  
  

graduates  
post docs  
other

### Title

Postdoctoral Position Spectromicroscopy Studies of Complex Processes in Thermal Catalysis and Electrochemistry.

### Institution

The Department of Interface Science headed by Prof. Beatriz Roldán Cuenya at the Fritz Haber Institute of the Max Planck Society in Berlin carries out cutting-edge research on advanced functional materials with applications in heterogeneous catalysis, energy conversion and electrochemistry. By combining unique synthesis methods, state-of-the-art tools for experimental characterization and advanced approaches to data analysis, atomistic details of thermal catalysis and electrochemical reactions at gas/solid and liquid/solid interfaces are revealed. In particular, structure-reactivity correlations on nanostructured materials can be established, paving the way for the rational design of novel catalytic materials.

### Position

We are currently looking for a postdoctoral researcher for the Spectro-Microscopy group. The group operates an ultra-high vacuum (UHV) based aberrations corrected and energy filtered Low Energy and Photoemission Electron Microscopy (LEEM/PEEM) at the UE49PGM-SMART high flux soft x-ray beamline at BESSY-II. This spectromicroscope is used to characterize catalytically active surfaces such as single crystal surfaces, oxide films and supported nanoparticles (NP) and to follow in real time and in situ processes such as epitaxial film growth, thermal reactions in a pressure range up to 10<sup>-5</sup> mbar and phase transitions. Various special equipment are connected to the microscope allowing for quasi in situ processes like UHV based plasma treatment, chemical reactions in near ambient pressure (NAP) and electrochemistry. The instrument excels at (1) the comprehensive characterization by combining various microscopy, diffraction and spectroscopy tools at high lateral and energy resolution of up to 2.6 nm and 180 meV, respectively, (2) high and tunable surface sensitivity between 0.3 and 3 nm, (3) high chemical sensitivity (elemental composition, chemical state) and structural sensitivity (surface reconstruction of adsorbed species, crystallinity, surface facet orientation) and (4) fast acquisition of the full field image (higher than video rate). Furthermore, the group operates a pure LEEM/PEEM microscope which is equipped with a high-pressure cell (HPC) to quasi in situ study chemical reactions on catalytically active surfaces with reactive gases in a pressure range up to 20 bar. The third instrument is a NAP-LEEM/PEEM which is dedicated to observe in real time thermal reaction in the mbar range.

**Responsibilities** The selected candidate can choose to pursue their main project in either thermal catalysis or electrocatalysis. Besides the main project, the candidate is expected to work in a team on diverse projects from collaborations (within the ISC Department and Catlab projects), and also support the experiments of the external users at the SMART beamline. Your challenge will be to improvise the methodologies of measurements and analysis towards varied samples and reactions following an initial training of the spectromicroscope.

**Requirements** We expect candidates to have:

- A PhD degree in Chemistry, Physics or Physical Chemistry, preferably with a specialization in electrochemistry or surface science.
- A strong publication record in renowned peer-reviewed journals.
- Knowledge about surface science techniques like e.g. XPS, NEXAFS, LEED, PEEM, LEEM, TDS.
- Experience at performing complex UHV or electrochemistry experiments with a high drive to solve scientific and practical/instrumental challenges independently.
- Experience working at synchrotron light sources (preferred, but not required)
- Ability to work in a team.
- Collaborative spirit and excellent English skills.

**Application procedure (deadline etc.)** Please submit your application via our online application portal [www.fhi.mpg.de/open-positions](http://www.fhi.mpg.de/open-positions) as soon as possible but latest by August 31, 2022 including the following documents:

- Curriculum vitae
- List of publications
- Names and email addresses of three references

The Max Planck Society endeavours to achieve gender equality and diversity. Furthermore, the Max Planck Society aims to increase the participation of women in research. Therefore, applications by women are particularly welcome. The Max Planck Society is also committed to increasing the number of individuals with disabilities in its workforce and therefore encourages applications from such qualified individuals.

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