

Cutting-edge Research for a Changing World



Helmholtz-Zentrum
hereon

PhD Position – Water at Catalytic Interfaces

Reference code: 956 – 2026/WG 1

Location: Teltow

Application deadline: March 4th, 2026

Join the Cluster of Excellence "BlueMat: Water-Driven Materials" (www.tuhh.de/bluemat) and contribute to one of Europe's most exciting research initiatives. Collaborate with a dynamic, interdisciplinary team that combines science, sustainability, and technology to create a better future. Help shape the next generation of sustainable materials inspired by nature's most powerful resource: water.

For the Institute of Functional Materials for Sustainability, Helmholtz-Zentrum Hereon we are looking as soon as possible for a PhD to conduct research within the project "Water at Catalytic Interfaces" as part of the BlueMat Cluster of Excellence. The position is fixed-term for three years until January 31st, 2029.

The BlueMat project "Water at catalytic interfaces" will investigate the role of water and ions in determining the efficiency and selectivity of catalytic reactions in which proton transfer, thus water, plays a decisive role in shaping the chemical products. By systematically examining how water and ionic environments influence reaction pathways, we aim to uncover fundamental principles that govern

Helmholtz-Zentrum Hereon

The Helmholtz-Zentrum Hereon conducts cutting-edge international research for a changing world: Around 1,000 employees contribute to the tackling of climate change, the sustainable use of the world's coastal systems and the resource-compatible enhancement of the quality of life. From fundamental research to practical applications, the interdisciplinary research spectrum covers a unique range.

Institute of Functional Materials for Sustainability

Studies are focused on the development of functional materials for renewable energies and biological applications in order to enable a sustainable future. Current topics range from solar fuel production, to waste upcycling for additive manufacturing, and sustainable

product distribution and catalytic performance. Close collaboration with theory will be central to guiding and rationalizing the experiments, while synchrotron-based techniques will provide detailed insights into the atomic-level processes. By linking mechanistic understanding at the atomic scale to system-level performance, this project aims to establish design principles that can inform the development of next-generation catalytic materials.

Equal opportunity is an important part of our personnel policy.

Your tasks

- synthesis and modification of catalytic and photo(electrocatalytic) materials (e.g. electrodes, thin films, nanostructures)
- electrochemical and photoelectrochemical testing with a focus on proton-coupled reactions and tandem approaches including thermal catalysis
- operando and in situ characterization of catalytic interfaces, including synchrotron- and neutron-based techniques
- systematic investigation of the role of water, ions, and electrolyte composition on activity and selectivity
- design and optimization of electrochemical and photoelectrochemical reactors, including basic modeling and simulations in collaboration with theory partners
- quantitative data analysis and visualization; application of data-science or AI-based approaches where appropriate
- active participation in group meetings, collaborations, and dissemination of results through reports, publications, and presentations

plastic-like materials for biological applications. We span materials synthesis, advanced operando characterization, and lab scale testing. We use robotic, high-throughput methods, and data science to accelerate novel sustainable materials discovery.

Interested?

Then we are looking forward to receiving your comprehensive application documents (cover letter, CV, transcripts, certificates, etc.) indicating the reference number 2026/WG 1 until March 4th, 2026.

[Apply now](#)

If you have questions, please contact Prof. Francesca M. Toma (francesca.toma@hereon.de). Please apply via our [online application system](#).

Your profile

- Master's degree (or equivalent) in chemistry, materials science, chemical engineering, physics, or a related field
- strong motivation and passion for experimental research and scientific discovery
- ability to work independently as well as collaboratively in an interdisciplinary research environment
- very good written and spoken English
- willingness to participate in synchrotron experiments, including occasional night shifts

Additional qualifications (advantageous but not required)

- experience in electrochemistry or photoelectrochemistry
- experience in materials synthesis and characterization
- familiarity with operando or in situ techniques
- basic programming or data-analysis skills (e.g. Python, MATLAB)
- experience in collaborative or international research environments

We offer you

- an exciting and interdisciplinary research environment within the BlueMat Cluster of Excellence
- close supervision and mentoring within an international team at Helmholtz-Zentrum Hereon and TUHH
- access and training to state-of-the-art synthesis, characterization, and imaging infrastructure

- collaboration with leading experts in materials science, theory, and advanced characterization
- opportunities to participate in international conferences, research stays, and collaborative networks
- a well-connected research campus (public transport) and best networking opportunities, subsidy for the Deutschlandticket if certain conditions are met (job ticket)
- social benefits according to the collective agreement of the public service and remuneration up to pay group 13 according to TV EntgO Bund
- an excellent technical infrastructure and modern workplace equipment
- 6 weeks holiday per year; company holidays between Christmas and New Year's Day
- very good compatibility private and professional life; offers of mobile and flexible work
- PhD Buddy Program
- family-friendly company policy with childcare facilities, e.g. parent-child room
- free assistance program for employees (EAP)
- corporate benefits

Severely disabled persons and those equaling severely disabled persons who are equally suitable for the position will be considered preferentially within the framework of legal requirements.



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