



UNIVERSITY
OF COLOGNE

Faculty of Mathematics and Natural Sciences

Doctoral Position (f/m/x) Chemistry – N₂ Reduction through TiO₂ Aerogels

Institut of Inorganic and Materials Chemistry



We are one of the largest and oldest universities in Europe and one of the most important employers in our region. Our broad range of subjects, the dynamic development of our main research areas and our central location in Cologne make us attractive for students and researchers from around the world. We offer a wide range of career opportunities in science, technology, and administration.

Professor Dr Milow's Nanostructured Cellular Materials group focuses on the synthesis of highly porous, open-pored, and nanostructured materials known as aerogels. These materials possess many advantageous properties, such as high sound absorption and extremely low thermal conductivity, making them highly attractive materials with applications in many different fields, such as super-insulation materials in the aerospace, automotive, and building services industries.

YOUR TASKS

- » Research as part of the DFG project "Ammonia on Site" and collaboration with UBT, the University of Ulm, and our team at DLR
- » Research work at both the University of Cologne and the DLR
- » Development of manufacturing processes for photo-chargeable TiO₂ aerogels for ammonia synthesis from N₂ following time-delayed irradiation
- » Physicochemical characterization
- » Optimization of synthesis parameters for tunable properties such as porosity or doping, also with a view to scaling
- » Comparison of TiO₂ aerogels based on molecular precursors with TiO₂ fibers and particles, as well as hybrid forms
- » Investigation of the influence of reaction conditions on photocatalytic efficiency and activity
- » Adaptation of the material for liquid- and gas-phase reactors
- » Demonstration of the simultaneous conversion of N₂ and CO₂ to urea

YOUR PROFILE

- » Master's degree in chemistry, materials chemistry, or a comparable degree
- » Practical knowledge of the production and optimization of materials; experience with aerogels or highly porous materials
- » Experience operating measuring instruments and the ability to use them independently

- » Knowledge of relevant chemical and physical parameters and the resulting material properties
- » Security Vetting for Employment at DLR

WE OFFER

- » DFG project in collaboration with the DLR and other partners
- » A diverse working environment with equal opportunities
- » Support in balancing work and family life
- » Extensive advanced training opportunities
- » Occupational health management offers
- » Flexible working time models

The University of Cologne promotes equal opportunities and diversity. Women will be considered preferentially in accordance with the Equal Opportunities Act of North Rhine-Westphalia (Landesgleichstellungsgesetz – LGG NRW). We also expressly welcome applications from all suitable candidates regardless of their gender, nationality, ethnic and social origin, religion, disability, age, sexual orientation and identity.

The position is available from 1 November 2026 on a part-time basis (26,69 hours per week). The position is to be filled for a fixed term of 36 months. If the applicant meets the relevant wage requirements and personal qualifications, the salary is based on remuneration group 13 TV-L of the pay scale for the German public sector.

Please apply online with proof of the required qualifications without a photo under: <https://jobportal.uni-koeln.de>. The reference number is Wiss2608-14. The application deadline is 15 September 2026.

For further inquiries, please contact Dr Danny Bialuschewski (danny.bialuschewski@uni-koeln.de) and take a look at our [FAQs](#).



HR EXCELLENCE IN RESEARCH