



UNIVERSITY
OF COLOGNE

Faculty of Mathematics and Natural Sciences

PhD Position (f/m/x)

Humboldt Centre for Nano- and Biophotonics | Gather Lab



Foto: Thomas Jösel

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.

Organic light-emitting diodes (OLEDs) are a popular class of semiconductor devices that have made their way into everyday technologies such as smartphone and television screens, miniaturised devices for biomedical research, and to other specialised applications. However, our current understanding of the key factors that affect their performance is limited by the fact that most of the characterisation techniques used in the field obtain average properties of what in reality is an ensemble of molecules.

The aim of this project is to study the influence of molecular disorder on the light emission properties of individual molecules doped into state-of-the-art materials used in OLEDs. The project will apply single-molecule microscopy and spectroscopy techniques to obtain information about the degree of order of OLED materials at the nanoscale in thin films, as well as how such order/disorder impacts the orientation and photoluminescence of emitter molecules. It will involve state-of-the-art OLED fabrication and photophysical characterisation techniques, including a strong focus on single-molecule microscopy and spectroscopy studies of organic light-emitting molecules, as well as close collaboration with theoreticians from internationally renowned research groups.

We are looking for a suitable candidate to carry out this exciting and challenging project, which will bring unprecedented information about structure-property relationships in this popular class of organic semiconductor devices.

YOUR TASKS

- » Fabrication of solution-processed and thermally evaporated samples for single-molecule microscopy and spectroscopy
- » Construction and optimization of single-molecule microscopy setups
- » Development of image- and signal-processing software for single-molecule microscopy and spectroscopy data
- » Analysis of single-molecule microscopy data in collaboration with theorists from other institutions

YOUR PROFILE

- » You should have obtained (or be about to obtain) a Master's degree (or equivalent) in Physics, Physical Chemistry, Material Science, or a closely related subject with excellent results.

- » You should be highly motivated and have the capacity to work as part of a diverse, interdisciplinary team.
- » Experience in either microscopy, spectroscopy, or thin-film fabrication and characterization are desirable.

WE OFFER

- » A world-leading, highly skilled, interdisciplinary research team
- » 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
- » Opportunity to work remotely

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 immediately on a part-time basis (67%). It is initially limited for 24 months, with the possibility to extend the initial contract and work towards a PhD for a total duration of 3 years.

If the applicant meets the relevant wage requirements and personal qualifications, the salary will be 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 Wiss2504-09. The application deadline is 29.05.2025.

For further inquiries, please contact Dr Francisco Tenopala or Professor Dr Malte Gather (apply-to-hcnb@uni-koeln.de) and take a look at our [FAQs](#).



HR EXCELLENCE IN RESEARCH