



We are excited to announce new PhD positions in the cutting-edge fields of **Terahertz-Induced Magnetization Dynamics** and **Strongly Correlated Electron Dynamics**. These positions will be available in early 2024.

Scope:

Do you want to know what will happen if one punches a matter really hard?

This research will be focused on the study of dynamical non-equilibrium properties of spin-orbit coupled matter.

- First, we plan to investigate microscopic coupling mechanisms between the spin, orbital, lattice, and charge degrees of freedom using ultrafast stimuli excitation (terahertz and mid-IR).
- Second, using intense excitation, we intend to drive systems far from equilibrium into non-thermal transient states.
- Third, applying giant external magnetic fields (up to 10 T) we propose to control a ground state of matter.

Candidate:

A master's degree in Physics, Applied Optics, Condensed Matter Physics, Materials Science, or a related field with outstanding academic performance. Relevant coursework in photonics, electromagnetism, quantum mechanics, and optics is desirable.

Proficiency in experimental techniques relevant to Terahertz Ultrafast Dynamics, such as ultrafast laser systems, time-resolved pump-probe spectroscopy, THz spectroscopy, and MOKE. Familiarity with data analysis tools. Theoretical knowledge of principles and concepts.

Proficiency in programming is desirable, i.e. Python, MATLAB, Labview, Origin, or others, for data analysis, simulations, and modeling.

Excellent communication skills to present research findings effectively, both orally and in written form. Working language is English. Ability to work collaboratively in a research team and engage in scientific discussions.

A letter of recommendation from academic advisors, professors, or supervisors is highly desirable.

We are:

Optical Condensed Matter Science Group of Prof. Dr. P. H. M. van Loosdrecht, which consists of international scientists and students. Our aim is to identify, understand, and control the nature of various physical phenomena and functionalities of condensed matter systems. We approach this problem using a variety of linear and non-linear optical techniques and by developing microscopic models to describe the observed phenomena.

The research group Optical Condensed Matter Science is part of the II. Physikalisches Institut, a research institute within the Faculty of Mathematics and Natural Sciences of the University of Cologne.

Location:

University of Cologne - II. Physics
Optical Condensed Matter Science
Zùlpicher StraÙe 77
50937 Köln
Germany

Prof. Dr. Paul H. M. van Loosdrecht pvl@ph2.uni-koeln.de
<https://ph2.uni-koeln.de/arbeitsgruppen/loosdrecht>

Want to apply?

For questions about the position, please contact Dr. Evgeny A. Mashkovich
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