



Chair of Attosecond and Strong Field Physics

<https://www.atto.uni-freiburg.de/de>

PhD position

Attosecond photoionization delays in the molecular frame.

Relevant Tasks

- Development of an multi-pass cell
- Data acquisition
- Data Analysis
- Programming

What we offer?

- High impact physics project
- Access to state-of-the-art attosecond sources
- Participation to experiments at large scale facilities
- Salary level: 66% E13

Required skills

- PhD in Physics
- Solid background in atomic, molecular and optical physics.
- Curiosity and creativity

A PhD position is available in the field of attosecond science at the Albert-Ludwigs-University of Freiburg in Germany (<https://www.uni-freiburg.de/>).

The goal of the project is the characterization of the attosecond time delays in small molecules in the molecular frame. Attosecond time delays in photoionization in molecules are an extremely sensitive probe of electronic correlation effects and nuclear dynamics.

The orientation of the molecule at the photoionization instant will be determined by measuring in coincidence the photoion and the photoelectron generated by the combination of an attosecond pulse train and a synchronized infrared field. Information on the anisotropic molecular potential will be gained by comparing the photoemission delays for different spatial directions.

The experiments will be performed with a high-repetition rate attosecond source operating at 50 kHz. A Reaction Microscope, developed in close collaboration with the group of Dr. Moshhammer at the Max-Planck Institute for Nuclear Physics in Heidelberg, will be used for the acquisition of the photoelectron and photoion spectra.

References:

P. Carpeggiani et al. *Nat. Photon.* **11**, 383–389 (2017).

H Ahmadi et al *J. Phys. Photonics* **2** 024006 (2020).

The project will focus on three aspects:

- Development of a compressor based on a nonlinear multi-pass cell for the generation of ultrashort laser pulses.
- Operation of an attosecond beamline optimized for long-term stability.
- Acquisition and analysis of the photoelectron spectra generated by the attosecond pulses using a reaction microscope.

Deadline for application: **31.12.2021**

The position is available from **01.02.2022** for a period of four year.

Interested, please contact :

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