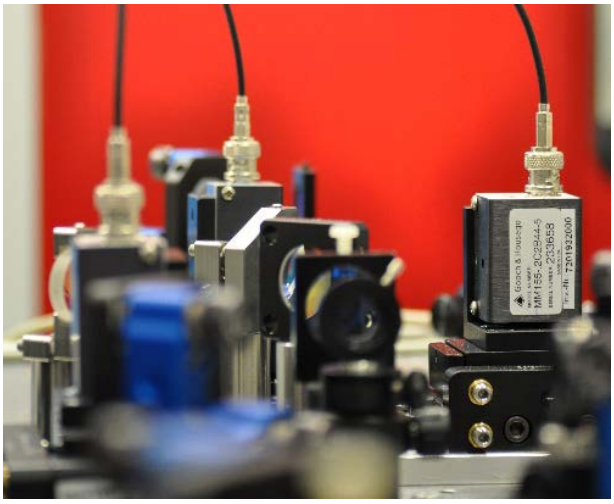
Institute of Physics
Molecular and Nanophysics
University of Freiburg
Prof. Frank Stienkemeier

PhD position in ultrafast coherent multidimensional spectroscopy



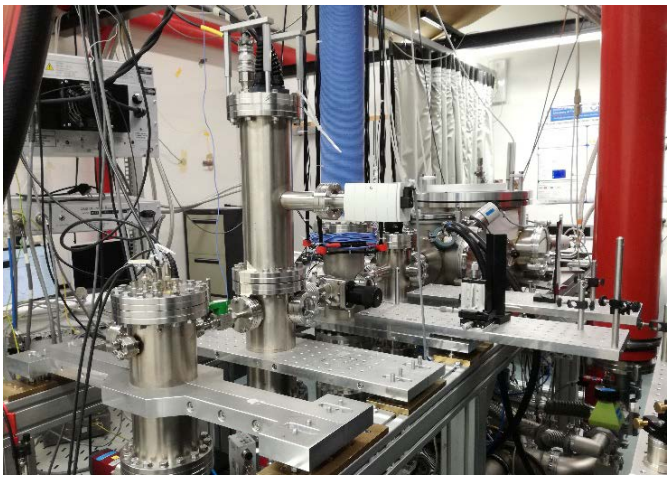
Setup for phase-modulated interferometry

In this PhD project, we aim at a better understanding of fundamental, ultrafast molecular processes relevant in solar energy conversion and photochemical reactions. For this purpose, ultrafast coherent multidimensional spectroscopy is the ideal method of choice, delivering a highly resolved spectro-temporal image of the molecular processes. Our group has recently extended the method to the gas phase to probe molecular and cluster beams in ultrahigh vacuum environments [1]. This approach uniquely enables the study of enclosed, well-controlled nanosystems and offers much higher resolution compared to studies in the condensed phase [2].

In the group of F. Stienkemeier at the University of Freiburg, Germany, we are offering a PhD project in experimental physics on this topic. The candidate will extend the experiment towards new target systems ranging from isolated organic molecules, to molecular charge-transfer complexes and molecular aggregates isolated in the gas phase. State-of-the-art ultrafast two-dimensional spectroscopy will be applied in combination with highly selective detection schemes (fluorescence, photoelectron and ion-mass spectrometry) to study the ultrafast dynamics in these systems.

[1] L. Bruder et al., Nat Commun **9**, 4823 (2018)
[2] L. Bruder et al., J. Phys. B: At. Mol. Opt. Phys. **52**, 183501 (2019)

Candidates should have strong interest in atomic and molecular physics or physical chemistry. Experience in the use of ultrafast lasers and vacuum equipment is advantageous. Applications including a letter of motivation, a CV, university certificates (with grades), transcripts of record and addresses of two referees should be sent in a **single** pdf-file to the contact below. Please indicate the subject “PhD 2D spectroscopy” in your email.



Vacuum apparatus for rare gas cluster production

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