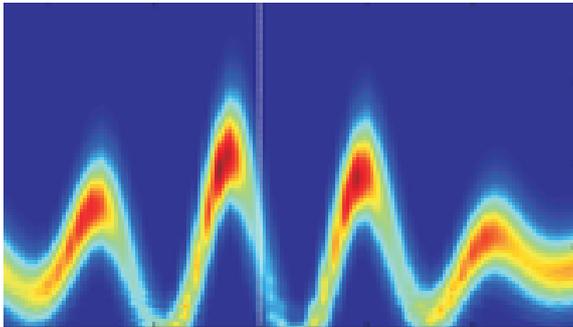




## 2 PhD positions in: Coherent nonlinear and multidimensional extreme ultraviolet spectroscopy



Attosecond streaking (Sansone group)

Time-resolved coherent nonlinear and multidimensional spectroscopy are very powerful tools to study the ultrafast dynamics and structure of complex quantum systems. While these schemes are well established in the IR to VIS spectral range, their transfer to the extreme ultraviolet (XUV) regime is currently one of the major goals in ultrafast spectroscopy. This development would combine the benefits of coherent nonlinear spectroscopy with unprecedented attosecond temporal and atomic spatial resolution, which is only achievable in the XUV to X-ray regime.

At the University of Freiburg, we are building a unique experimental apparatus to facilitate this new class of XUV spectroscopy. The research project is conducted in a close collaboration between the groups of G. Sansone and F. Stienkemeier, which combine their expertise in XUV and attosecond pulse generation and application (Sansone) [1,2], on the one hand, and coherent nonlinear and multidimensional spectroscopy (Stienkemeier) [3,4], on the other hand. The PhD students will build a specialized interferometric setup for timing and phase control of intense femtosecond laser pulses and combine it with a high-harmonic generation laser source. This unique setup will provide unprecedented information about coherent and nonlinear processes studied in fundamental systems on femto- to attosecond time scales. Experiments will focus on the study of coherent wave packet dynamics, attosecond metrology and two-color VIS-XUV two-dimensional electronic spectroscopy.

In this exciting project, we are seeking for two highly motivated PhD students to join our team. You should have a strong interest in experimental 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 XUV spectroscopy" in your email.



Femtosecond laser (Stienkemeier group)

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[1] G. Sansone *et al.* *Science* **314**, 443-446 (2006).

[2] G. Sansone *et al.* *Nature* **465**, 763-766 (2010).

[3] L. Bruder *et al.* *Nat Commun* **9**, 4823 (2018).

[4] A. Wituschek *et al.* *arXiv:1906.07112v2* (2019).

