

## PhD position in Theoretical Attosecond Science at ETH Zurich

Applications are invited for a PhD position (3-4 years) in the Ambizione research project “Exact Factorization Approach to the Dynamics of Molecules in Strong Laser Fields” at the Laboratory of Physical Chemistry, ETH Zurich, Switzerland.

Attosecond science holds the promise to understand chemical reactions in a fundamental way, by using ultrashort laser pulses to observe the dynamics in molecules on the time scale of electronic motion. The aim of this research project is to develop theoretical tools for this purpose.

The project is based on a novel single-electron description of many-electron dynamics (see [1]). It aims at (a) understanding how many-electron effects in strong ultrashort laser fields manifest themselves in this single-electron picture, and (b) to develop new practical tools for the prediction and analysis of experimental outcomes. Aim (b) is facilitated by collaboration with the experimental attosecond science group of Hans Jakob Wörner.

Initially, the PhD project should contribute to aim (a) by numerical simulation and analysis of exactly solvable model systems which describe effects of experimental interest. Depending on the progress of these investigations, it may also become possible to contribute to aim (b).

The following skills are required (+) and appreciated (-):

- + creativity and scientific curiosity
- + strong affinity for fundamental research
- + excellent Master of Science in chemistry, physics, or a comparable field
- + fluent oral and written communication in English
- knowledge of electronic structure methods and quantum dynamics
- programming skills (Fortran, C, Python, ...)
- knowledge of UNIX-based operating systems

Your application should contain the following:

- CV
- personal statement (max. 3 pages), including your qualifications and your motivation to apply for this position
- copy of your B.Sc. and M.Sc. thesis, references to already published scientific work
- contact details for two references

Questions as well as applications should be send to Axel Schild ([axel.schild@phys.chem.ethz.ch](mailto:axel.schild@phys.chem.ethz.ch)).

## References

- [1] <https://doi.org/10.1103/PhysRevLett.118.163202>  
<https://arxiv.org/abs/1701.02285>