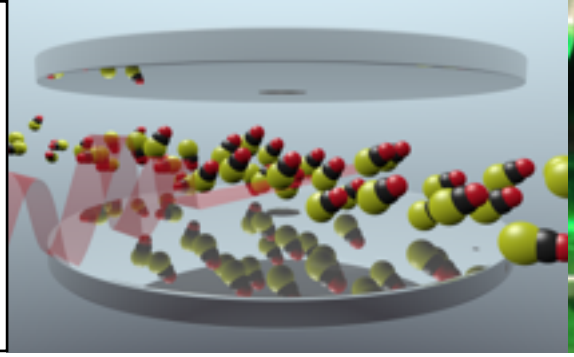
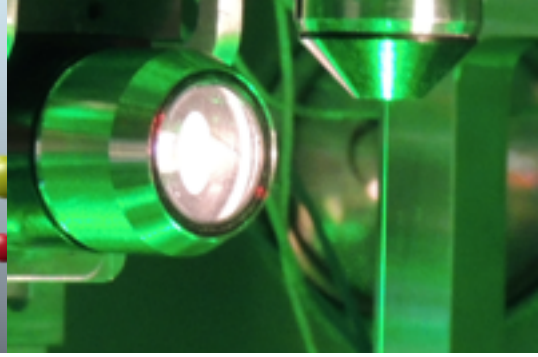
CFEL SCIENCE
Controlled Molecule Imaging





Bachelor/Master thesis

Computation framework development of optically controlled particles experiments

The Controlled Molecule Imaging group at the Center for Free-Electron Laser Science at DESY and University of Hamburg performs novel experiments on the control and imaging of gas-phase molecules and their intrinsic ultrafast dynamics. We develop unique experimental approaches to record movies of molecules at work.

These novel experimental approaches are supported by computational simulations based on classical trajectory calculations in combined electric and laser fields. To allow for the simulation of optical manipulation of nano-objects and ver large biological objects, such as viruses or protein complexes, we are extending our computation suite to include new models of the underlying physics as well as the experimental apparatus used.

We offer a undergraduate thesis project to extend our simulation framework CMIfly and to implement new-physics descriptions in the simulation codes.

A successful candidate will have a strong background in modern software development. Experience in physics, hydrodynamics, and optics as well as in numerical methods is a plus.

We offer unique research opportunities in an interesting and open team and with first-class experimental and computational facilities. Our group is embedded in the Center for Free-Electron-Laser Science, DESY, the University of Hamburg and the excellence cluster Hamburg Center for Ultrafast Imaging.

J. Chem. Phys. 131, 064309 (2009) — http://dx.doi.org/10.1063/1.3194287
Int. Rev. Phys. Chem. **34**, 557 (2015) — http://dx.doi.org/10.1080/0144235X.2015.1077838
Phys. Rev. Applied 4, 064001 (2015) — http://dx.doi.org/10.1103/PhysRevApplied.4.064001

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DESY

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