# Instrumentation Scientist

## PostDoctoral research

CFEL SCIENCE
Controlled Molecule Imaging

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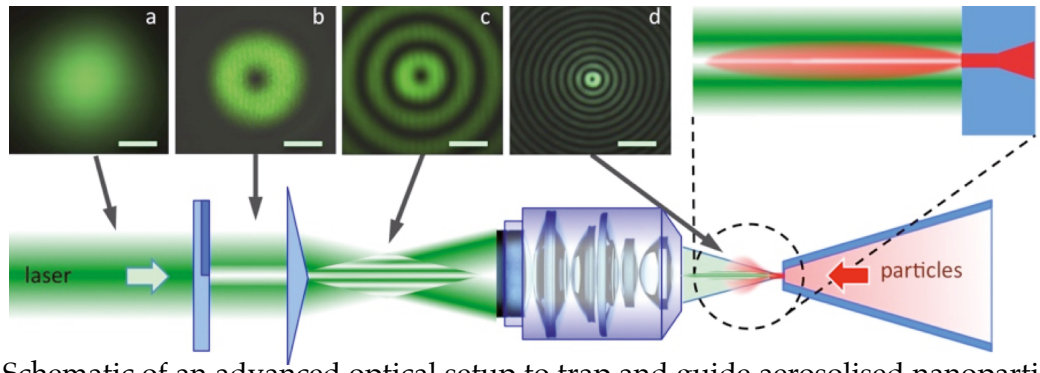
The Controlled Molecule Imaging group at the Center for Free-Electron Laser Science at DESY and Universität Hamburg performs novel experiments on the control and imaging of gas-phase molecules and their ultrafast dynamics with applications in fundamental physics, chemistry and structural biology.

We develop new experimental approaches to cool and control complex molecules, such as spatial separation of individual molecular species, alignment and orientation of molecules in space, and the creation of well-defined molecular wavepackets. We image molecular structures and dynamics — recording movies of molecules at work — using ion and electron imaging as well as coherent diffractive imaging techniques with x-rays and electrons. This work is accompanied by sophisticated data analysis, computational modeling, and *ab initio* theory developments.

## Instrumentation scientist — control + imaging of large particles

In this postdoctoral project you will be developing beyond-state-of-the art experiments, as part of the European Research Council funded project CO-MOTION. This includes the development, setup and operation of ultra-high vacuum ($10^{-10}$ mbar) and cryogenic-temperature (4 K) equipment, modern optics and laser technologies, and shaped electric and laser fields. You will contribute intellectually and practically to a highly-motivated and well-trained interdisciplinary research team of scientists, engineers and technicians. The developed experimental setups will be employed for novel diffractive-imaging experiments, both at FEL facilities as well as in laboratory based setups.




Schematic of an advanced optical setup to trap and guide aerosolised nanoparticles using vortex laser beams.

*Int. Rev. Phys. Chem.* **34**, 557 (2015) – DOI: 10.1080/0144235X.2015.1077838
*Opt. Exp.* **21**, 30492 (2013) – DOI: 10.1364/OE.21.030492

CMI offers unique research opportunities in an interesting, open, international team and with first-class experimental and computational facilities. Our group is embedded in the Center for Free-Electron-Laser Science, Deutsches Elektronen-Synchrotron DESY, Universität Hamburg, and the Hamburg Center for Ultrafast Imaging.

https://www.controlled-molecule-imaging.org

DESY

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