

## Resonant dispersive wave development for advanced optical pump/soft X-ray probe investigations

Are you curious about how atoms and electrons move on the fastest timescales imaginable? Join the Attosecond Science Group (<https://atto.cfel.de>) at the Center for Free-Electron Laser Science (CFEL), where we create and harness ultrashort laser pulses with durations in the attosecond ( $1 \text{ as} = 10^{-18} \text{ s}$ ) and few-femtosecond ( $1 \text{ fs} = 10^{-15} \text{ s}$ ) range. These pulses allow us to observe and manipulate ultrafast dynamics in systems ranging from bio-relevant molecules to clusters and nanoscale materials. By exploring these fundamental processes, we aim to deepen our understanding of the earliest steps in photochemistry and pave the way for potential control over these ultrafast reactions.

### What You'll Do:

As part of this project, you'll gain hands-on experience in cutting-edge experimental techniques used in ultrafast laser science. You will:

- Learn methods for compressing and converting laser pulses from the near-infrared to the ultraviolet spectrum.
- Work with state-of-the-art technology, including resonant dispersive wave emission, to generate tunable ultrashort laser pulses.
- Get involved in building optical setups, characterizing pulse durations, collecting data, and analyzing results.
- Possibly use these pulses in our soft X-ray pump-probe setup to investigate ultrafast processes at the atomic and molecular level.

This project offers an exciting opportunity to immerse yourself in an active research environment, develop valuable laboratory skills, and contribute to experiments at the forefront of ultrafast science.

### Who Should Apply:

We welcome motivated master's students with a background in physics, optics, physical chemistry, or related fields. Prior experience with lasers or optics is a plus but not required—enthusiasm for experimental work and a desire to explore the ultrafast world are the most important qualifications!

## Group

FS-ATTO

## Project Category

A5. Lasers and optics

## Special Qualifications

## DESY Site

Hamburg

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