The Max-Born Institute for Nonlinear Optics and Short Pulse Spectroscopy (MBI) conducts basic research in the field of nonlinear optics and ultrafast dynamics arising from the interaction of light with matter and pursues applications that emerge from this research. It develops and uses ultrafast and ultra-intense lasers and laser-driven short-pulse light sources in a broad spectral range in combination with methods of nonlinear spectroscopy.

With its research, MBI fulfills a national mission and is an integral part of the international scientific community. The Max-Born-Institute invites applications for the position

PhD student (m/f/d)

Laser-induced electron diffraction off strongly aligned and oriented molecules by tailored laser and DC electric field

Job profile:
We propose to develop a novel approach towards imaging ultrafast photochemical reactions making use of high energy photoelectrons generated by strong field ionization with femtosecond mid-IR laser pulses. Photoelectron angular distribution (PAD) of laser-aligned molecules following ionization with a mid-infrared laser pulse will be recorded using a velocity map imaging spectrometer. Electron-molecule rescattering in the laser field is expected to lead to a diffraction pattern in the PAD that can be used to extract the molecular structure.
The successful candidate will participate in the installation of the pump-probe experimental setup and will be responsible for carrying out strong field ionization experiments on aligned molecules. At the theoretical level, the PhD will develop a simple model based on photon/electron diffraction to retrieve the molecular structure from the diffraction pattern extracted from the PAD.
The method will be then applied to time-resolve the dissociation dynamics of aligned OCS and indole-water molecules where the concept of using the photoelectron angular distribution to extract internuclear distances will be validated.
This project will be performed in close collaboration with Prof. J. Küpper at the University of Hamburg. The PhD is expected to perform experiments both at the Max Born Institute and at the Center for free electron laser in Hamburg.

Requirements:
We are looking for a motivated PhD student (m/f/d) holding a Diploma or master degree in physics or physical chemistry at the date of recruitment. The candidate should have a good knowledge of ultrashort lasers, non-linear optics and molecular dynamics.

Offer:
The researcher position is available immediately and initially limited to 3 years. The payment is according to the German TVöD salary scheme for scientists in public research institutions (75%).

MBI is an equal opportunity employer and places particular emphasis on fostering career opportunities for women. Qualified women are therefore strongly encouraged to apply. If equally qualified, severely handicapped persons are given preference.

MBI supports the reconcilability of family and working life and is certified as family-friendly by the "family audit".

Please use the button "Apply online" and upload your application with a CV, letter of interest in research, two letters of reference and a certificate of the Diploma/Master degree electronically via the MBI online recruiting platform at https://mbi-berlin.de/de/karriere. The deadline for applications is **16th June 2020.**

For further information and inquires please contact Dr. Rouzée, (rouzee@mbi-berlin.de) or under https://mbi-berlin.de/research/projects/23-time-resolved-xuv-science/project-goals/.