



The Chair of BioMolecular Optics, Ludwig-Maximilians-University München

is seeking a **PhD Student** to participate in the research project

Optical control of competing chemical channels at the full speed of intramolecular nuclear motion

At the time scale of the electronic motion the dynamics in molecules can be influenced directly by appropriate electromagnetic fields. The photo-modulated electronic density in the molecules provides the gradients that drive the intramolecular nuclear motion. This should be an effective handle to steer chemical reactions by exploiting momentum control of the vibronic wavepacket. The analysis of the structured laser fields that can selectively drive one or the other channel in the case of several possible products will provide a deep insight into the underlying dynamics. To fully realise this potential, shaped few-cycle light pulses in the UV with sub-structures at least as short as 10 fs are needed. So far this has not been realised, since only pulse structures on the order of 50 fs were available.

Within the project we will combine amplitude and phase shaping in the Fourier space for ultra-broad band visible pulses with achromatic sum frequency mixing. The pulses will be applied to control the phase of electronic excitations in molecules and to select a distinct product in the case of photochemical and -physical processes with competing channels. We are looking for a PhD student who is interested in performing molecular control experiments and transferring shaped ultra-broad band pulses into the UV. A strong background in ultrafast molecular dynamics and/or nonlinear optics is highly advantageous.

For further information see <http://www.map.uni-muenchen.de/res-areas-C25.en.html>.

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