Contribution ID: **58** Type: **On-site planned, but remote also possible**

Investigation of photo-induced ultrafast processes in purely organic molecular crystals by time-resolved photocrystallography.

The internship will be an opportunity offered by FS-SCS group in photon science division of DESY to work for a limited period of time, in an onsite project. Interns are usually undergraduate students with physics or related background and the internship last for close to 6-7 weeks.
The FS-SCS group is mostly invested in investigating energy conversion and structural changes in molecules during chemical reactions, using different photon-based technologies. The group is well known for studying the time-dependent electronic and spatial behaviors of the molecules under external stimuli such as light photons, in real time. The group continue to pursue the elusive "molecular movie methods"in the fields related to time-resolved and ultrafast X-ray physics, which include various types of ultrafast X-ray and optical spectroscopy techniques as well as high-resolution ultrafast X-ray diffraction and scattering methodologies. Our study helps to shed light on how different processes that takes place at different time scales in the event of a photo-induced chemical reaction, in solids or solutions, are correlated. The results also help us to understand how much of the structural changes are local and how much of the structural dynamics is distributed through inter-atomic or inter-molecular interactions, in the system. We also spend a lot of time in researching what type of apparatus needs to be built and which kind of methods need to be developed for investigating the created ultrafast "time stamps"in the structure of complex matters during the course of a chemical or biochemical reaction.
During his/her stay at the group, the student will get a taste of dealing with time-resolved photocrystallography datasets collected at synchrotron facilities. The training will help them to understand the geometry and logistics of these experiments. How different software packages or programming codes are used to process these datasets. The student will also gain a hands-on experience in steady-state optical spectroscopic and single crystal X-ray diffraction measurements. Moreover, the student will gain the important knowledge on how to combine spectroscopy and crystallography while deciphering solid state reactions, in real time. The opportunity will provide a firsthand learning experience to an undergraduate student with physics or related background, to go through the cutting-edge experimental and theoretical techniques that involves our research at FS-SCS. We believe the experience will be quite helpful for the students aspiring a future in the field of scientific research, in academia or industry.

Field

A2: Molecular sciences (application oriented)

DESY Place

Hamburg

DESY Division

FS

DESY Group

FS-SCS

Special Qualifications:

knowledge in a pogramming language will be a plus.

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