

Time-resolved single particle imaging study on nano structures

This project introduces the concepts of x-ray coherent diffraction imaging and the application of these concepts to single particle imaging experiments at free electron laser sources. The project is hosted by scientists of the SPB/SFX (Single Particle, clusters & Biomolecules and Serial Femtosecond Crystallography) scientific instrument at the European XFEL.

The computational tools used to simulate this type of experiment will be explained and the student given the opportunity and guidance to explore their use. The end goal of the project is to assist SPB/SFX instrument scientists to process experimental data from the x-ray instrument, leading to a reconstruction result.

Program outline:

1. Introduction to coherent X-ray diffraction imaging
2. Introduction to single-particle imaging at XFEL facilities
3. Basic coding, phase retrieval processes, EMC reconstruction, etc.
4. EMC reconstruction with real dataset (nano particles)

The program is split approximately 40% physics, 50% computing, 10% instrumentation (introduction to EuXFEL instrument)

Field

A4: Development of experimental techniques (methodology oriented)

DESY Place

Hamburg

DESY Division

other

DESY Group

EuXFEL - SPB/SFX

Special Qualifications:

Some knowledge of python (or other programming language) will be an advantage although not essential.
Some previous knowledge of x-ray physics will be an advantage although not essential.

Primary author: KIM, Chan (Eur.XFEL (European XFEL))

Co-authors: BIELECKI, Johan; Dr E, Juncheng (European XFEL); BEAN, Richard (Eur.XFEL (European XFEL))