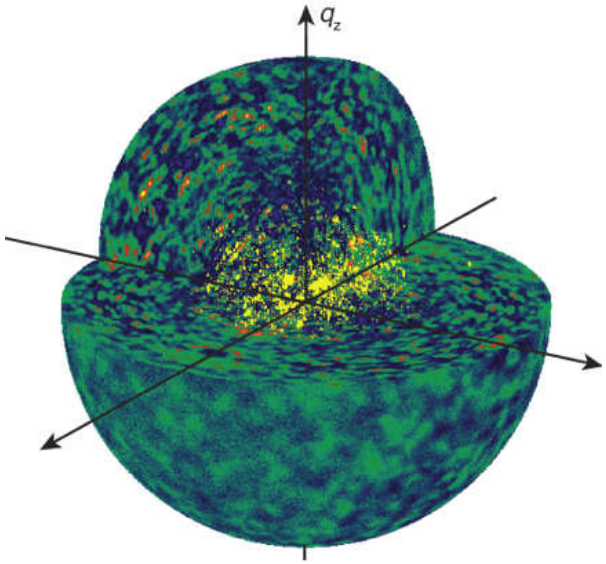
UNIKASSEL VERSITÄT

Physikalisches Kolloquium

Thursday, 09.02.2017, 17:15, HS 100
Reception with coffee & cookies 16:45

Prof. Dr. Henry Chapman, DESY/Universität Hamburg:

Imaging Macromolecules with X-ray Laser pulses



Abstract
The short wavelength of X-rays allows us to resolve atoms, but in practise for biological materials the achievable resolution is limited by the destruction of the sample by the radiation that forms the image. For over 100 years, the workaround to this problem of radiation damage has been to average signals from repeating copies of the object arranged in a large crystal. It is now possible to overcome damage limits by using intense X-ray pulses that vaporise the sample, but which are short enough in duration to freeze any motion of the sample on the atomic scale. With the advent of X-ray FELs we have been able to confirm this principle, and are now applying it to overcoming a major bottleneck for protein crystallography, which is the need for large well-diffracting crystals. The intense pulses also open up opportunities to help solve the crystallographic phase problem. In particular we have found that commonly-occurring disordered crystals that are usually not considered useful for measurement, can be treated as an ensemble of isolated but aligned molecules. The continuous diffraction from this ensemble can be treated as "single molecule" diffraction, which can be used to directly synthesis an image of the molecule. We demonstrate this technique by reconstructing images of photosystem II complexes at 3.5 Å resolution.

All of you interested in physics are cordially invited!

Contact: Prof. Dr. Thomas Baumert, More Information: uni-kassel.de/go/physikalisches_kolloquium