

Introduction to Hard X-ray Free Electron Lasers

Robert Feidenhansl¹

Oral Presentation
Wednesday 24 August
9:00

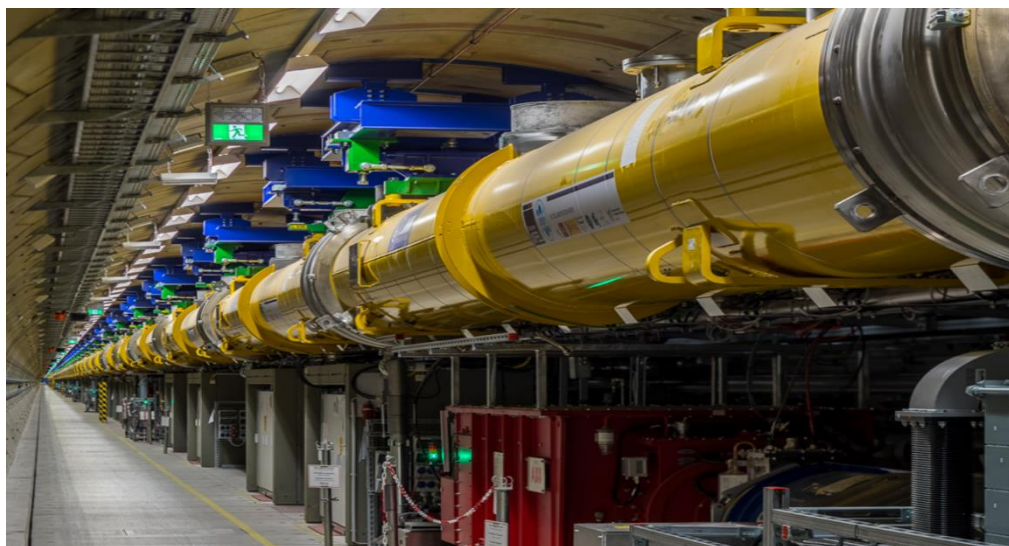
¹European XFEL, Holzkoppel 4, D-22869 Schenefeld, Germany

*e-mail: robert.feidenhansl@xfel.eu

Hard X-ray Free Electron (XFEL) lasers provide extremely intense and ultra-short X-ray pulses that are ideal to investigate structure and dynamics of matter at atomic time scales. X-ray free electron lasers have been in operation for more than 10 years now and have shown to have a wide range of areas of applications in physics, chemistry, materials and structural biology.

In my talk I will present the main principles of the science that can be performed, how experiments are different from synchrotron radiation experiments and how they are similar. Examples will be given from recent experiments from European XFEL in various areas of science.

European XFEL is the most recent large-scale research infrastructure in Europe and was taken into user operation in September 2017. The facility includes a 3.5 km long tunnel with a 2 km long superconducting accelerator from DESY in Hamburg/Bahrenfeld to Schenefeld in Schleswig-Holstein where the experimental hall with 6 experimental instruments is placed. The instruments offer a wide range of experimental capabilities. Since the start of operation, exciting user experiments have been conducted within physics, chemistry, bio crystallography and material science.



A glimpse of the 2 km long superconducting accelerator.