



European XFEL and the European Cluster of Advanced Laser Light Sources

G.A. Appleby and T. Tschentscher
European XFEL Facility, Notkestraße 85, 22607 Hamburg, Germany
Corresponding author: graham.appleby@xfel.eu

The European X-ray Free Electron Laser (XFEL) Facility is nearing the end of its construction phase in Hamburg, Germany. The 3.4km long facility will generate 27000 pulses per second of ultrabright, coherent X-rays, allowing scientists to observe nanoscale processes at timescales on the order of femtoseconds. With beamlines dedicated to making optimal use of these X-ray pulses for experiments including scattering, diffraction, absorption, photo-electron spectroscopy and imaging, the European XFEL will open up areas of research that were previously inaccessible.

In parallel to the development of the European XFEL, further efforts to combine X-ray radiation with laser light are taking place at ESRF in Grenoble and at the Extreme Light Infrastructure (ELI), as well as at the national facilities DESY, PSI, MAX IV, Elettra and HZDR, who develop and operate their own free electron lasers and optical laser driven X-ray beamlines.

To generate collaboration and synergy between these large scale sources of laser driven and accelerator driven X-ray radiation, European XFEL is leading the European Cluster of Advanced Laser Light Sources (EUCALL) network which has received funding of 7M€ from the EU's Horizon 2020 research and innovation programme and runs until September 2018.

Under EUCALL, the facilities work together on common methodologies and research opportunities. There are work packages devoted to the development of new software for simulations and for processing of advanced radiation experiments, as well as for new hardware for standardised sample delivery and beam diagnostics for ultra-fast laser experiments.

This presentation will outline the European XFEL, its current status and what can be expected in the first years of commissioning, and also provide an introduction to the EUCALL network, its objectives and its scientific progress to date.

