

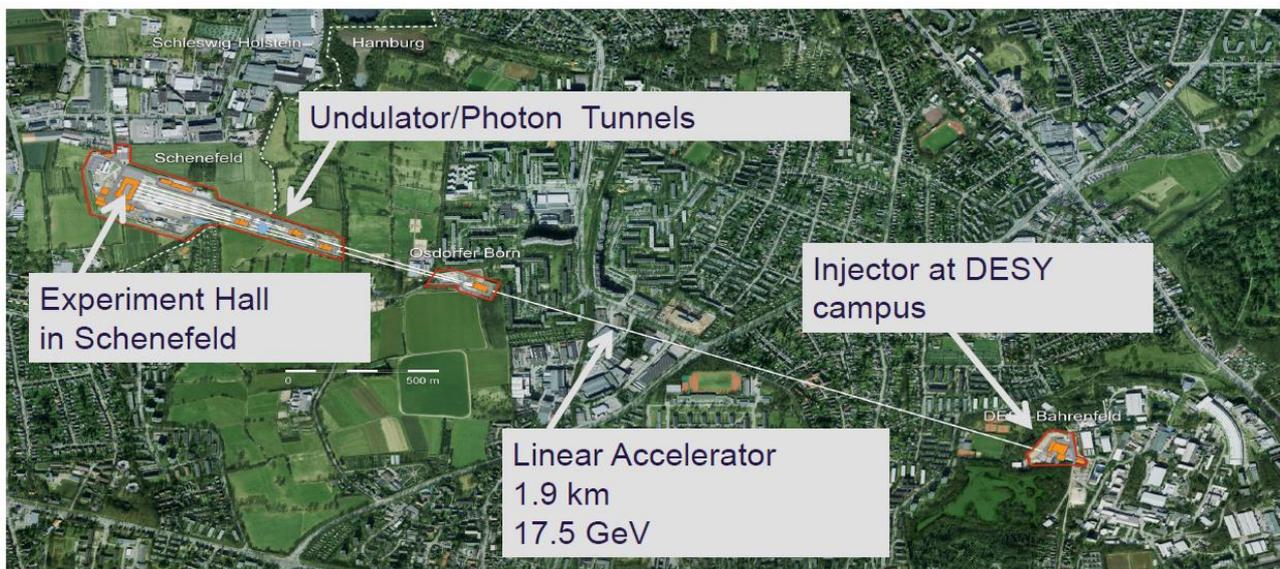
New X-ray Science Opportunities at European XFEL

Robert Feidenhans'l
European XFEL, Schenefeld, Germany
robert.feidenhansl@xfel.eu

The European X-ray Free Electron Laser is the brightest X-ray free electron laser in the world. It will be able to deliver up to 27000 intense ultrashort X-ray pulses per second due to its superconducting linear accelerator. The facility started commissioning in 2017 and went into operation July 1 2017. First lasing at hard x-ray energies was observed in May 2017 on the first set of instruments. Lasing was achieved in February 2018 on the second set of instruments and lasing in all three radiation sources was achieved on May 2 2018.

User experiments have been conducted since September last year. The first two instruments that opened for user experiments were the FXE instrument for ultra-fast X-ray spectroscopy and X-ray scattering and the SPB/SFX instrument for diffractive imaging and structural determination for single particles, clusters and biomolecules. At the end year of this year two more instruments will be taken into operation. The last two instruments will go on-line in 2019. In total the six instruments this will cover a wide range of scientific fields from biology to material science and will open up new areas of science in particular within ultrafast dynamics.

In the talk I will give a description of the facility [1] including a status report of the first year the operation, a glimpse into results from the first experiments and an outlook into the prospects for the coming years.



Outline of the European XFEL

[1] T. Tschentscher, C. Bressler, J. Grünert, A. Madsen, A. P. Mancuso, M. Meyer, A. Scherz, H. Sinn, U. Zastra *Appl. Sci.* 2017, 7(6), 592; DOI: 10.3390/app7060592

XFEL site <https://www.xfel.eu>