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Using synchrotron radiation in condensed matter research

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Abstract
Synchrotron radiation is nowadays used in many sensitive research tools that are employing X-rays. We will give an introduction into the creation of X-rays at synchrotron radiation sources and describe their basic properties. Principles of synchrotron radiation instrumentation on which beamline design are based will also be briefly covered. The main part of the lecture will deal with the interaction of X-rays with matter as well as the X-ray scattering, spectroscopy and microscopy techniques that are based on this. Finally we will give a few science examples illustrating how these techniques can be applied in condensed matter research.