



## **CRISTAL : *Cristal*lography and structure of condensed matter**

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### **Areas of application, instrumentation and methodologies used**

Energy range: 5 – 30 keV

CRISTAL is a multi-technique diffraction beamline dedicated to studies of the structural properties of condensed matter, on different length and time scales, possibly in non-ambient conditions. All the standard techniques for structural analysis on single crystals and powders are proposed, as well as more advanced techniques exploiting the specific features of a third generation synchrotron (brilliance and coherence).

Sample environment: Temperature, pressure, laser irradiation, gas cell, potentiostat, current, electric-field.

### **Major disciplines**

**Powder diffraction:** high-angular resolution for ab initio structure determination / high-Q resolution measurements for Pair Distribution Function analysis / solid-solid phase transition kinetics, resonant X-ray powder diffraction.

**Single-crystal diffraction:** Structure determination, aperiodics, thin-films, diffuse scattering, resonant X-ray diffraction

**Determination of electron density:** high-Q-resolution diffraction

**Coherent Diffraction Imaging:** Bragg Coherent Diffraction Imaging / Ptychography for the studies of defects of nano-objects

**Micro diffraction:** micro diffraction imaging

**Time-resolved pump-probe diffraction:** pump 800 nm and 400 nm, 25 fs laser pulses. Probe: 10 ps / 80 ps X-ray pulses.