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FACULTÉ DES SCIENCES

Séminaire Commun :

- **LABORATOIRE DE CRISTALLOGRAPHIE**
- **DÉPARTEMENT DE CHIMIE MINÉRALE,
ANALYTIQUE ET APPLIQUÉE**

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Room A 150 , Sciences II

**Synchrotron radiation in chemistry:
a view from the Swiss-Norwegian Lab in Grenoble**

Yaroslav Filinchuk

Swiss-Norwegian Beam Lines (SNBL) at ESRF, Grenoble, France

www.snbl.org

Swiss-Norwegian Beam Lines is a general purpose crystallographic beamline situated at the European synchrotron (ESRF) in Grenoble. The beamline is focused on solving problems in materials science and crystal chemistry. Combination of point detector, CCD area detectors and a large area image plate provides a very versatile tool for many types of X-ray diffraction and scattering experiments, from structure determination of tiny single crystals to time-resolved, *in-situ* powder studies. In this talk, recent scientific activities at SNBL in the field of coordination and organic chemistry will be presented.

The most common use of diffraction in chemistry is the determination of crystal (and molecular) structures. I will show examples of how crystal structure, absolute configuration, and disorder can be determined and evaluated on crystals which are too small for a laboratory X-ray source. By diffraction on static crystals, one can look at dynamic phenomena such as tautomerism or molecular deformations responsible for negative thermal expansion.

However, the use of synchrotron radiation and dedicated beamlines is most fruitful when a system has to be studied under an effect of external *stimuli*. This includes a study of a photo-excited state, the pathways and kinetics of chemical reactions, materials for gas absorption etc. Such diffraction studies are made *in-situ*, both on powders and single crystals, and now at SNBL they can be coupled with optical Raman spectroscopy. A number of applications will be illustrated by recent results obtained at SNBL.