

**Organising
institution**

Università degli Studi di Padova
Dipartimento di Scienze chimiche - DiSC
Prof.ssa Silvia Gross

**Visiting
Professor**

Jan-Dierk Grunwaldt,
Karlsruhe Institute of Technology (KIT) (Germany)

**Course Title
and
Description**

Synchrotron applications under dynamic/operando conditions to molecular sciences, to catalysis, to materials and to energy

The project aims to let PhD and Postdoc students of the Department of Chemical Sciences be acquainted with the potential applications of synchrotron under dynamic/operando conditions to molecular sciences, to catalysis, to materials and to energy. Therefore its main impact is on the internationalization of the PhD and Postdoc didactic activities but it has also relevance in the research field.

Prof. Grunwaldt will be engaged in three main activities:

A scientific seminar titled "Tracking the structure of heterogeneous catalysts under dynamic conditions for the development of sustainable and low-emission chemical processes", 1 hour, open to all the staff of the Department and also to the staff of other interested departments;

A cycle of seminars (8 hours) titled 'Heterogeneous catalysis in environmental and energy related catalysis: From basic to advanced characterization using synchrotron radiation' for the students of the PhD courses in Molecular Sciences and Science & Engineering of Materials and Nanostructures and for post-doc researchers. The seminars are structured as follows: 1. Role of heterogeneous catalysis in environmental and sustainable chemistry 2. Future view on the feedstocks available for the chemical industry 3. Rational design of catalysts: theory, synthesis understanding 4. Characterization toolbox and X-ray absorption spectroscopy as unique tool at synchrotron radiation sources 5. Operando spectroscopy of catalysts in emission control, CO₂-hydrogenation and electrocatalysis 6. Advanced spectroscopic tools at synchrotron radiation sources; Scientific meetings with the department staff and of other University staff interested in developing scientific collaborations with prof. Grunwaldt.

Period

05/06/2022 – 17/06/2022

Course Level

PhD course in Molecular Sciences