CONFERENCE UNIVERSITAIRE
DE SUISSE OCCIDENTALE

IDECAT
Integrated Design of Catalytic Nanomaterials for a Sustainable Production

Advanced Course on Catalysis

February 1st to 6th, 2009

Eurotel Victoria, Villars-sur-Ollon, Switzerland

From Molecular to Reactor Design

General Scope

Nowadays, the chemical processes should be developed following the Green Chemistry principles which are but one facet of the broad issue of sustainability. Solving this issue requires bringing together, other than core knowledge in Catalysis, the expertise from Physical and Surface Chemistry, Nano- & micro-technology, Material Science and Chemical Engineering. Therefore, the development of chemical processes involves phenomena spanning over several orders of magnitude in both size and time.

The presentations will focus on the multi-scale aspects of catalytic systems. Heterogeneous, homogeneous and bio-catalysis will be approached in the same way, going all the way from molecular insight to the choice of the reactor.

The winter school is organized in the framework of the European Network of Excellence on the Integrated Design of Catalytic Nanomaterials for a Sustainable Production (IDECAT) and is aimed to disseminate catalysis science and to promote the mobility of PhD students and scientists who are active in this field.

Scientific Committee

Matthias Beller,
Applied Homogeneous Catalysis
Leipniz Institute for Catalysis, Rostock, D

Albert Renken
Chemical Reaction Engineering
École Polytechnique Fédérale de Lausanne, CH

Rutger A. van Santen
Molecular Heterogeneous Catalysis
Eindhoven University of Technology, NL

Organizing Committee

Lioubov Kiwi-Minsker, Micaela Crespo, Albert Renken

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Course schedule

Time	Sunday 01/02	Monday 02/02	Tuesday 03/02	Wednesday 04/02	Thursday 05/02	Friday 06/02
8:30 – 10:00		1. *R. van Santen/ M. Beller*	5. *M. Beller*	9. *F. Cavani*	13. *B. Weckhuysen*	17. *A. Corma*
10:00-10:30		**Coffee Break**				
10:30-12:00		2. *R. van Santen*	6. *J. Lercher*	10. *C. Copéret*	14. *M. Baerns*	18. *A. Wokaun*
12:00-17:30	**Registration 15:00-19:00h**	**Lunch Break**				
17:30-19:00		3. *L. Kiwi-Minsker*	7. *U. Bornscheuer*	11.1 *M. Beller* 11.2 *K. de Jong*	15. *A. Renken*	
19:00-20:30	**Dinner**					
20:30- 22:00		4. *A. Renken*	8. *T. Jacobs*	12. *K. de Jong*	16. *J. Schouten*	

Detailed scientific program

Monday, February 2nd

Introduction

1. Catalysis in Perspective (*Rutger van Santen and M. Beller*)

Concepts & Methods

2. Physical / chemical principles of heterogeneous catalysis (*Rutger van Santen)*
3. Kinetics of heterogeneous & homogeneous catalytic Reactions (*Lioubov Kiwi-Minsker)*
4. Transport phenomena in catalytic processes (*Albert Renken)*

Tuesday, February 3rd

The chemistry of catalytic reactivity & catalytic conversion

5. Homogeneous catalysis: hydrogenation / hydroformylation (*M. Beller)*
6. Heterogeneous catalytic systems & processes (alkane activation, alkylations) (*Johannes A. Lercher)*
7. Biocatalysis (*Uwe Bornscheuer)*
8. Electrocatalysis (*Timo Jacobs)*

Wednesday, February 4th

The chemistry of catalytic reactivity & catalytic conversion

9. Oxidation catalysis (homogeneous & heterogeneous) (*Fabrizio Cavani)*
10. Single center catalysis (homogeneous / heterogeneous) (*Christophe Copéret)*

Catalyst synthesis & materials

11.1. Molecular defined systems (*M. Beller)*
11.2. Heterogeneous inorganic catalysts & supports (*Krijn de Jong)*
12. Preparation of supported catalysts (*Krijn de Jong)*

Thursday, February 5th

Experimental methods for catalyst characterization

13. Heterogeneous catalysis – in situ methods (*Bert Weckhuysen)*

14. Catalyst testing, design of experiments (*Manfred Baerns)*

Reactor devices and operation

15. Catalytic reaction engineering (*Albert Renken)*

16. Multifunctional reactors (*Jaap Schouten)*

Friday, February 6th

Reactor devices and operation

17. Zeolites for fine chemicals (*Avelino Corma)*

18. Energy related catalysis (*Alexander Wokaun)*

Course instructors

- **Manfred Baerns.** Max-Planck-Gesellschaft, Fritz-Haber-InstitutFaradayweg 4-6, 14195 Berlin, Germany http://www.science24.com/person/mbaerns
- **Matthias Beller**. Applied Homogeneous Catalysis, Leibniz Institute for Catalysis at the University of Rostock, 18059 Rostock, Germany, http://www.catalysis.de/Applied-Homogeneous-Catalysis.20.0.html?&L=1
- **Uwe Bornscheuer**. Biotechnology & Enzyme Catalysis, Ernst-Moritz-Arndt University, D-17487 Greifswald, Germany, http://www.chemie.uni-greifswald.de/~biotech/
- **Fabrizio Cavani**. Selective catalytic oxidation, University of Bologna, Bologna, Italy, http://www.eng.unibo.it/PortaleEn/default.htm
- **Christophe Copéret.** Laboratoire de Chimie Organométallique de Surface, CNRS, CPE, 69622 Villeurbanne, France, http://www.cpe.fr/
- **Avelino Corma**. Universidad Politécnica de Valencia, Spain, http://www.upv.es/noticias/noti428c.html
- **Timo Jacobs**. Electrochemistry and Fuel Cells, Fritz-Haber-Institute of the Max-Planck Society, Berlin & University Ulm, Germany, http://www.uni-ulm.de/theo_echem/timo.shtml
- **Krijn de Jong.** Inorganic Chemistry and Catalysis, Utrecht University, The NetherlandsNetherlands, http://www.anorg.chem.uu.nl/people/professors/KrijndeJong/index.htm
- **Lioubov Kiwi-Minsker.** Ecole polytechnique fédérale de Lausanne, Group of catalytic reaction engineering, 1015 Lausanne, Switzerland, http://isic2.epfl.ch/Jahia/site/lcbp/cache/offonce/pid/64469;jsessionid=26DB3F7F7205AC9A8F00676AA7B002A6
- **Johannes A. Lercher**. Department Chemie, Technische Universität München, 85748 Garching, http://thor.tech.chemie.tu-muenchen.de/~tc2/eng/people/lercher/index.html
- **Albert Renken**. Ecole polytechnique fédérale de Lausanne, Institute of Chemical Sciences & Engineering, 1015 Lausanne, Switzerland, http://isic2.epfl.ch/page62517-en.html
- **Rutger von Santen.** Eindhoven University of Technology, Molecular Heterogeneous Catalysis, 5600 MB Eindhoven, The Netherlands, http://yp.chem.tue.nl/showemp.php/382
- **Jaap C. Schouten**. Eindhoven University of Technology, Chemical Reactor Engineering, 5600 MB Eindhoven, The Netherlands, http://yp.chem.tue.nl/showemp.php/312
- **Bert Weckhuysen.** Inorganic Chemistry and Catalysis, Utrecht University, The Netherlands, b.m.weckhuysen@uu.nl
- **Alexander Wokaun.** General Energy Research Department, Paul Scherrer Institut, 5232 Villigen PSI, Switzerland**,** http://ene.web.psi.ch/

Practical information

Registration

All participants have to register prior to **December 8th, 2008**. The number of participants is limited to 70. (1st come 1st served). Please download the registration form available at http://isic.epfl.ch/catalysis-course

Your registration will be considered by the organization committee and you will receive a letter of acception by December 15, 2008. At this point, you have to pay the registration fee to complete the registration.

Venue

The WinterSchool will be held in the Eurotel-Victoria (phone +41 24 495 3131) in Villars-sur-Ollon in the Swiss Alps near Montreux/Lausanne

- http://www.eurotel-victoria.ch/villars/SiteVillars.html
- http://www.villars.ch/en/welcome.cfm

Participation Fee

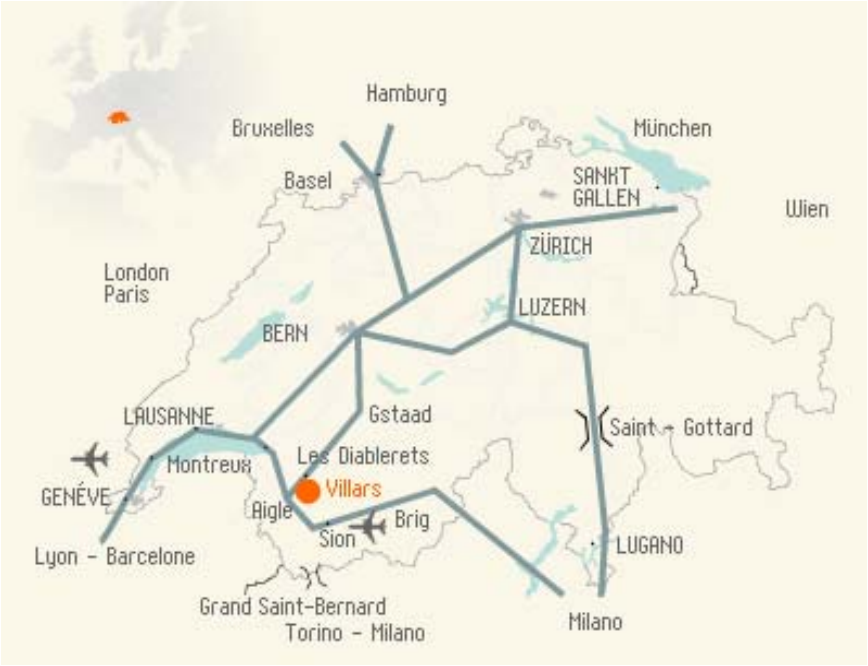
The participation fee covers the total cost of the seminar including full board from Sunday evening to Friday noon (5 nights, including coffee breaks and all meals excluding beverages):

- CHF 925.- (ca. € 580) for double room accommodation
- CHF 1150.- (ca. €780) for single room accommodation

Participants belonging to the IDECAT Network can use their IDECAT funds to pay travel and accommodation fees.

The "Conference universitaire de Suisse occidentale" subsidizes participants from CUSO universities or associated organizations. They have to use a separate form (http://isic.epfl.ch/catalysis-course)

Travel



Villars is accessible by train from all the main airports in Switzerland.

There is a half-hourly connection from Geneva, Basel, and Zürich to Aigle and Bex, where you have to change to a local train (from Bex) or a bus (from Aigle) to reach **Villars-sur-Ollon**.

For the schedule see: http://www.sbb.ch/en/.