

# Program of the Bunsen International Discussion Meeting “Photocatalysis”

Thursday, Oct. 13, 2011

8:45 – 9:00 Welcome address

9:00 – 9:45 (invited)

*Photochemistry on TiO<sub>2</sub>*

John Yates (Department of Chemistry, University of Virginia)

9:45 – 10:30 (invited)

*The Surfaces of a Prototypical Photocatalyst: TiO<sub>2</sub>*

Ulrike Diebold (Institute for Applied Physics, Technical University of Vienna)

10:30 – 11:00 Coffee break

11:00 – 11:45 (invited)

*Semiconductor Photocatalysis for Anaerobic Addition and Aerobic Oxidation Reactions*

Horst Kisch (Department of Chemistry and Pharmacy, University of Erlangen-Nürnberg)

11:45 – 12:10 *Unraveling complex photocatalytic chemical reactions by broadband transient absorption spectroscopy over many time scales*

Eberhard Riedle [1], Uwe Megerle [1], Matthias Wenninger [1], Roger-Jan Kutta [2], Burkhard König [3], and Bernhard Dick [2]; [1] Lehrstuhl für BioMolekulare Optik, Ludwig-Maximilians-Universität München; [2] Institut für Physikalische und Theoretische Chemie, Universität Regensburg; [3] Institut für Organische Chemie, Universität Regensburg

12:10 – 12:30 *Charge Sensitive X-Ray Photoelectron Spectroscopy for Probing Molecular Nature of Electret Formation*

Hikmet Sezen, Eda Yilmaz, and Sefik Suzer (Department of Chemistry, Bilkent University)

12:30 – 14:00 Lunch break

14:00 – 14:45 (invited)

*Carbon Nitrides and Metal Nitrides: Towards Artificial Photosynthesis*

Markus Antonietti (Colloid Chemistry Department, Max Planck Institute for Colloid and Interface Research)

14:45 – 15:30 (invited)

*Nanostructure Architectures for Energy Conversion*

Prashant Kamat (Department of Chemistry and Biochemistry, University of Notre Dame)

15:30 – 16:00 Coffee break

16:00 – 16:20 *Titania based photocatalytically active layer-by-layer coatings*

Dariya Dontsova [1], Valérie Keller [2], Nicolas Keller [2], Pascal Steffanut [3], Olivier Félix [1], and Gero Decher [1,4,5,6]; [1] Institut Charles Sadron, CNRS; [2] Laboratoire des Matériaux, Surfaces et Procédés pour la Catalyse, CNRS, Université de Strasbourg; [3] Clariant Produkte (Schweiz) AG; [4] Faculté de Chimie, Université de Strasbourg; [5] International Center for Frontier Research in Chemistry; [6] Institut Universitaire de France.

16:20 – 16:40 *The interaction of carboxylic acids with rutile TiO<sub>2</sub> (110) single crystal surfaces: Results from IR-spectroscopy*

Maria Buchholz [1], Mingchun Xu [2], Yuemin Wang [2], Alexei Nefedov [1], and Christof Wöll [1]; [1] Institute of Functional Interfaces, Karlsruhe Institute of Technology; [2] Chair of Industrial Chemistry, Ruhr University Bochum

16:40 – 17:00 *TiO<sub>2</sub>-based hybrid thin films with ordered mesoporosity for photocatalytic applications*

Michael Wark [1,2], Viktor Yarovy [2], Inga Bannat [2], Adel A. Ismail [3], and Detlef W. Bahnemann [3]; [1] Laboratory of Industrial Chemistry, Ruhr-University Bochum; [2] Institute of Physical Chemistry and Electrochemistry, Leibniz University Hannover; [3] Institute of Technical Chemistry, Leibniz University Hannover.

17:00 – 20:00 Poster session (see below for the list of the posters) with refreshments (drinks & food – from 18:00)

## **Friday, Oct. 14, 2011**

9:00 – 9:45 (invited)

*Photocatalytic Water Splitting in Mesoscopic Systems*

Michael Grätzel (Laboratory of Photonics and Interfaces, Ecole Polytechnique de Lausanne)

9:45 – 10:30 (invited)

*The Role of Particle-Particle and Particle-Molecule Interactions in Photocatalysis*

Detlef Bahnemann (Chemistry Department, University of Hannover)

10:30 – 11:00 Coffee break

11:00 – 11:20 *Bimetallic Pd<sub>x</sub>Pt<sub>1-x</sub>/TiO<sub>2</sub> photocatalytic materials for enhanced simultaneous elimination of CO and VOCs in the presence of humidity*

Olivier Rosseler [1], Alain Louvet [2], Nicolas Keller [1], and Valérie Keller [1]; [1] Laboratory of Materials, Surfaces and Processes for Catalysis (LMSPC), CNRS, Strasbourg University; [2] Direction Générale de L'Armement (DGA), DGA CBRN Expertise.

11:20 – 11:40 *Novel visible-light photocatalysts for hydrogen production via efficient photo-induced water splitting process*

Roland Marschall [1], Michael Wark [1], Lianzhou Wang [2], and Gaoqing (Max) Lu [2]; [1] Lehrstuhl für Technische Chemie, Ruhr-Universität Bochum; [2] ARC Centre of Excellence for Functional Nanomaterials, The University of Queensland.

11:40 – 12:00 *Titanate Nanostructures: Transformation Processes and photoelectronic Properties*

Michael J. Elser [1], Alexander Riss [2], Andreas Sternig [1], and Oliver Diwald [1]; [1] Institute of Particle Technology, University of Erlangen-Nuremberg; [2] Department of Physics, University of California

12:00 – 12:15 Final remarks

## List of the posters

P01: *Markov state models and dynamical fingerprints: unravelling the complexity of molecular kinetics*

Bettina G. Keller, Jan-Hendrik Prinz, and Frank Noé

Freie Universität Berlin, Arnimallee 6, 14195 Berlin, Germany

P02: *Photocatalytic Hydrogen production with Yttrium titanate and Yttrium tantalum oxynitride*

Oliver Merka [1,2], Ann-Christin Möller [1], Viktor Yarovyi [1], and Prof. Dr. Michael Wark [1,2]

[1] Institute of Physical Chemistry and Electrochemistry, Leibniz University Hannover, 30167 Hannover, Germany; [2] Laboratory of Industrial Chemistry, Ruhr-University Bochum, 44801 Bochum, Germany

P03: *Solar light and dopant induced recombination effects: photoactive nitrogen in TiO<sub>2</sub> as a case study*

Massimiliano D'Arienzo [1], Nicolas Siedl [2], Roberto Scotti [1], Franca Morazzoni [1], and Oliver Diwald [2]

[1] University of Milano Bicocca; Milano, Italy; [2] Institute of Particle Technology, University of Erlangen-Nuremberg, D-91058 Erlangen, Germany

P04: *Photocatalytic CO<sub>2</sub> reduction on dye sensitized TiO<sub>2</sub>*

Leo Pöttinger [1], Anna Keese [2], Florian Staier [1], Michael Zharnikov [1], Michael Grunze [1], and Thomas Bürgi [3]

[1] Institute of Physical Chemistry, Heidelberg University, 69120 Heidelberg, Germany; [2], Institut für Toxikologie und Genetik, Forschungszentrum Karlsruhe, 76344 Eggenstein-Leopoldshafen, Germany; [3] Département de Chimie Physique, Université de Genève, 1211 Genève, Switzerland

P05: *Solar2Fuel: spectroscopic investigations of a photocatalyst for CO<sub>2</sub> reduction*

Anna Keese [1,2], Michael Grunze [1], and Patrick Koelsch [1,2]

[1] Applied Physical Chemistry, University of Heidelberg, 69120 Heidelberg, Germany; [2] Institute of Toxicology and Genetics, Karlsruhe Institute of Technology, 76344 Eggenstein-Leopoldshafen, Germany

P06: *Solar2Fuel: Spectroscopic and electrochemical characterization of functionalized TiO<sub>2</sub> surfaces for photocatalytic reduction of CO<sub>2</sub>*

Florian Staier, Michael Grunze, and Michael Zharnikov

Angewandte Physikalische Chemie, Universität Heidelberg, Im Neuenheimer Feld 253, 69120 Heidelberg, Germany

P07: *Photo-induced NO reduction over TiO<sub>2</sub> nanoparticles*

Heshmat Noei, Martin Muhler, and Yuemin Wang

Laboratory of Industrial Chemistry, Ruhr-Universität Bochum, D-44780, Bochum, Germany

P08: *Studying the Electron Transfer in a Photocatalytic System based on an Ir(III)-complex*

A. Pazidis [1], A. Neubauer [1], A. Friedrich [1], V.N. Popok [2], H. Hartmann [2], K.-H. Meiwes-Broer [2], F. Gärtner [3], H. Junge [3], M. Beller [3], and S. Lochbrunner [1]

[1] University of Rostock, Institute for Physics, Universitätsplatz 3, 18051 Rostock, Germany; [2] University of Rostock, Institute for Physics, Universitätsplatz 3, 18051

Rostock, Germany; [3] Leibniz Institute for Catalysis Rostock, Albert-Einstein-Str. 29a, 18059 Rostock, Germany

*P09: Photocatalysis with supported size-selected metal clusters*

Josef Kiermaier [1], Dr. Martin Tschurl [1], Andreas Winbauer [1], PD Dr. Friedrich Esch [1], Prof. Dr. Claude Henry [2], and Prof. Dr. Ulrich Heiz [1]  
[1] TU Muenchen, Catalysis Research Center, Lichtenbergstr. 4, 85748 Garching, Germany;  
[2] CINaM-CNRS, Campus de Luminy, Case 913, 13288 Marseille Cedex 09, France

*P10: Linear and non-linear properties of size selected metal cluster on surfaces*

Martin Tschurl [1], Martin Thämer [1], Philipp Heister [1], Aras Kartouzian [2], Sabine Gerlach [1], and Ulrich Heiz [1]  
[1] Physikalische Chemie, TU München, 85748 Garching, Germany; [2] Oxford Chemistry Physical and Theoretical Chemistry Laboratory South Parks Road Oxford, UK

*P11: Experimental setup of a time-of-flight mass spectrometer for reaction product detection in heterogeneous catalysis*

Andreas Winbauer, Martin Tschurl, Josef Kiermaier, Ullrich Boesl, and Ullrich Heiz  
Chemistry Department, Technical University of Munich, Germany

*P12: Ultrafast Free Charge Generation in Hybrid P3HT/Si Photovoltaics*

D. Herrmann [1], S. Niesar [2], C. Grill [1], P. Rupp [1], C. Scharsich [3], Köhler [3], M. Stutzmann [2], and E. Riedle [1]  
[1] LS für BioMolekulare Optik, LMU München, 80538 München, Germany; [2] Walter Schottky Institut, TU München, 85748 Garching, Germany; [3] Lehrstuhl EP II, Universität Bayreuth, 95440 Bayreuth, Germany

**These posters will be complemented by the posters representing the current activities of the Physical-Chemical-Institute (PCI) of the University of Heidelberg**