

## nanoGe Fall Meeting 2018 (FallMeeting18)

### S2 Light Driven Water Splitting

Torremolinos, Spain, 2018 October 24th - 26th

Conference Chairs: Wolfram Jaegermann and Bernhard Kaiser

### Conference Program

#### October 24th - Day 3 (Wednesday)

##### WatSpl S2.1

Chair: Christina Scheu  
Room: Mediterraneo ABC

- 14:30 - 15:00  
S2.1-I1 Martin Rohloff, Björn Anke, Spark Zhang, Christina Scheu, Martin Lerch, Anna Fischer (*University Freiburg, IAAC, Germany*)  
Improving BiVO<sub>4</sub> thin Film Photoanodes for Light-Induced Water Oxidation
- 15:00 - 15:15  
S2.1-O1 Luis I. Granone (*Institute of Technical Chemistry, Gottfried Wilhelm Leibniz University Hannover, Callinstrasse 3, D-30167 Hannover, Germany*), Ralf Dillert, Detlef W. Bahnemann  
Effect of the Degree of Inversion on the Photocatalytic Activity of Spinel ZnFe<sub>2</sub>O<sub>4</sub>
- 15:15 - 15:30  
S2.1-O2 Hamidreza Hajiyani (*Department of Physics, Theoretical Physics and Center of Nanointegration (CENIDE), Universität Duisburg-Essen, Lotharstraße 1, 47057 Duisburg, Germany*), Alexander G. Hufnagel, Siyuan Zhang, Thomas Bein, Dina Fattakhova-Rohlfing, Christina Scheu, Rossitza Pentcheva  
Origin of Enhanced Efficiency of Tin-doped Ultrathin Hematite Photoanodes for Water-Splitting
- 15:30 - 15:45  
S2.1-O3 Sönke Müller (*Institute for Solar Fuels, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Hahn-Meitner-Platz 1, 14109 Berlin, Germany*), James Hirst, Hannes Hempel, Daniel Peeters, Alexander Sadlo, Oliver Mendoza, Dariusz Mitoraj, Dennis Friedrich, Anjana Devi, Radim Beranek, Rainer Eichberger  
The Transport Pathways of Charge Carriers in CuWO<sub>4</sub> for Photocatalysis
- 15:45 - 16:00  
Discussion
- 16:00 - 16:30  
S2.1-I2 Vladimir Smirnov (*IEK5-Photovoltaics, Forschungszentrum Jülich, 52425 Jülich, Germany*), Katharina Welter  
Multijunction Si Solar Cells for Integrated Photo-Electrochemical Devices
- 16:30 - 16:45  
S2.1-O4 Jens Melder (*Institut für Anorganische und Analytische Chemie und Freiburger Materialforschungszentrum (FMF), Albert-Ludwigs-Universität Freiburg, Albertstraße 21, 79104 Freiburg*), Stefan Mebs, Philipp Heizmann, Holger Dau, Philipp Kurz  
Electrochemical Water Oxidation by MnO<sub>x</sub>/CFP – pH Dependence of the Catalytic Activity
- 16:45 - 17:00  
S2.1-O5 Alfred Ludwig (*Institute for Materials, Ruhr-Universität Bochum, D-44801 Bochum, Germany*), Mona Nowak, Swati Kumari, Helge S. Stein, Ramona Gutkowski, Joao Junqueira, Wolfgang Schuhmann  
Combinatorial Fabrication and High-Throughput Characterization of Thin Film Metal Oxide Libraries for Solar water Splitting

#### October 25th - Day 4 (Thursday)

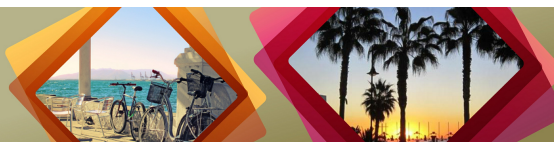
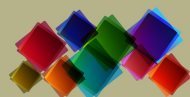
##### Plenary Session 5

Chair: Daniel Vanmaekelbergh  
Room: Torremolinos AB

- 09:00 - 09:30  
5-K1 Maksym Kovalenko (*Institute of Inorganic Chemistry, Department of Chemistry and Applied Bioscience, ETH Zurich, 8093 Zurich, Switzerland*)  
Colloidal Nanocrystals of APbX<sub>3</sub> Perovskites [A=Cs<sup>+</sup>, CH<sub>3</sub>NH<sub>2</sub><sup>2+</sup>, X=Cl<sup>-</sup>, Br<sup>-</sup>, I<sup>-</sup>]: Surface Chemistry, Self-Assembly and Potential Applications

##### WatSpl S2.2

Chair: Laurence Peter  
Room: Mediterraneo ABC



- 09:00 - 09:30 S2.2-11 Sophia Betzler, Thomas Gänsler, Katharina Hengge, Anna Frank, Siyuan Zhang, Christina Scheu (*Max-Planck-Institut für Eisenforschung Düsseldorf*)  
Nb<sub>3</sub>O<sub>7</sub>OH Nanoarrays for Photocatalytic Water Splitting: Defects, Dopants, and Stability of co-Catalysts
- 09:30 - 09:45 S2.2-03 Emanuel Ronge (*University of Goettingen*), Vladimir Roddatis, Jonas Ohms, Philipp Kurz, Christian Jooss  
In-Situ Transmission Electron Microscopy Analysis of a Calcium-Birnessite Water-Oxidation Catalyst
- 09:45 - 10:00 S2.2-04 Thorben Petersen (*Carl von Ossietzky University Oldenburg*), Thorsten Klüner  
Quantum Chemical Investigation of Water Splitting on ideal TiO<sub>2</sub>-Anatase(101)
- 10:00 - 10:15 S2.2-01 Sanjay Mathur, Lasse Jürgensen, Yakup Gönüllü, Jennifer Leduc, Thomas Fischer (*Department of Chemistry, Inorganic Chemistry, University of Cologne*)  
Oxide Bilayers as High Efficiency Water Oxidation Catalysts through Electronically Coupled Phase Boundaries
- 10:15 - 10:30 S2.2-02 Sasa Lukic (*Nanoparticle Process Technology (NPPT), Institute for Combustion and Gas Dynamics, University of Duisburg-Essen, 47057 Duisburg, Germany*), Jasper Menze, Martin Muhler, Markus Winterer  
Generation of Zinc-Gallium-Oxynitride Nanoparticles from CVS Powders for Photocatalytic Water Splitting

10:30 - 11:00 **Coffee Break**

**WatSpl S2.3**

Chair: Bruce Parkinson  
Room: Mediterraneo ABC

- 11:00 - 11:30 S2.3-11 Kristin Kirchberg, Roland Marschall (*Justus Liebig University Giessen*)  
Nanostructured Spinel Ferrite Materials for Photoelectrochemical Water Splitting
- 11:30 - 11:45 S2.3-01 Hyo-Jin Ahn (*University of Erlangen-Nürnberg*), Anandarup Goswami, Francesca Riboni, Stepan Kment, Alberto Naldoni, Radek Zboril, Patrik Schmuki  
A Strategy to Decrease the High Onset Potential of Hematite Photoanodes by Gradient Doping and Decoration with Zn-Co Layered Double Hydroxide
- 11:45 - 12:00 S2.3-02 Hong Nhan Nong (*Dept. of Chemistry, Technical University Berlin, Strasse des 17. Juni 124, TC 03, 10623 Berlin, Germany*), Tobias Reier, Paul Paciok, Detre Teschner, Marc Heggen, Valeri Petkov, Robert Schlögl, Travis Jones, Peter Strasser  
Operando Studies of Hole-Doped IrNiOx core-shell electrocatalysts for Water Oxidation in acidic Environment
- 12:00 - 12:15 S2.3-03 Maria Eugenia Toimil-Molares (*GSI Helmholtz Centre for Heavy Ion Research*), Florent Yang, Dimitri Korjakin, Christina Trautmann, Christopher Schröck  
Photoelectrochemical Performance of Arrays of Cu<sub>2</sub>O/TiO<sub>2</sub> and Au/Cu<sub>2</sub>O/TiO<sub>2</sub> Nanowires Fabricated by Electrodeposition
- 12:15 - 12:30 S2.3-04 Cora Bubeck (*University of Stuttgart, Institute for Material Science, Heisenbergstraße 3, 70569 Stuttgart, Germany*), Marc Widenmeyer, Gunther Richter, Mauro Coduri, Eduardo Salas Colera, Songhak Yoon, Frank Osterloh, Anke Weidenkaff  
Perovskite-type Oxynitrides LaTaO<sub>2</sub>N and LaTaON<sub>2</sub> – Synthetic Strategies

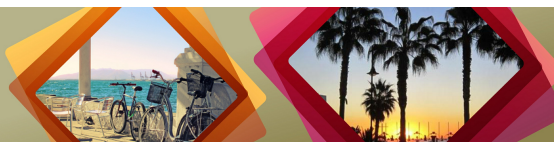
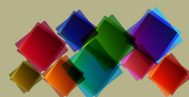
12:30 - 14:30 **Lunch**

14:30 - 16:00 **Internal Project Meeting**

**WatSpl S2.4**

Chair: Krishnan Rajeshwar  
Room: Mediterraneo ABC

- 16:00 - 16:30 S2.4-11 Matthias M. May (*University of Heidelberg*)  
Challenges and Opportunities of Water Splitting with Multi-Junction Solar Absorbers
- 16:30 - 16:45 S2.4-01 Laurent Pedesseau (*Univ Rennes, INSA Rennes, CNRS, Institut FOTON - UMR6082, F-35000 RENNES*), Ida Lucci, Simon Charbonnier, Maxime Vallet, Pascal Turban, Yoan Leger, Tony Rohel, Nicolas Bertru, Antoine Létoublon, Jean-Baptiste Rodriguez, Laurent Cerutti, Eric Tournié, Anne Ponchet, Gilles Patriarche, Charles Cornet  
GaP Template on Si for Solar Water Splitting: Surface Energy Engineering



16:45 - 17:00 Peter Cendula (*University of Zilina*), Matthew T. Mayer, Jingshan Luo, Linfeng Pan, Michael Grätzel  
S2.4-O2 Elucidation of Photovoltage Enhancements and Charge Transport in Multijunction Cu<sub>2</sub>O Photocathode through Semiconductor Simulations

17:30 - 19:00 **Poster session**

### October 26th - Day 5 (Friday)

#### Plenary session 6

Chair: Sascha Sadewasser  
Room: Torremolinos AB

09:00 - 09:30 Marina Leite (*University of Maryland*)  
6-K1 Probing Solar Cells at the Nanoscale through Real-Time Functional Imaging

#### WatSpl S2.5

Chair: Roland Marschall  
Room: Mediterraneo ABC

09:30 - 10:00 Laurence Peter (*Department of Chemistry, University of Bath*), - Gurudayal, Lydia Helena Wong, Fatwa Abdi  
S2.5-O1 Understanding the Role of Nanostructuring in Photoelectrode Performance for Light-Driven Water Splitting

10:00 - 10:15 Shababa Selim (*Imperial College London, Department of Chemistry, South Kensington Campus, London, SW7 2AZ*), Laia Francas, Camilo Mesa, Andreas Kafizas, Dongho Lee, Kyoung-Shin Choi, James R. Durrant  
S2.5-O2 Investigating the Influence of Nanostructuring on Photoanode Performance

10:15 - 10:30 Fanxing Xi (*Helmholtz Zentrum Berlin für Materialien und Energie GmbH*), Peter Bogdanoff, Sebastian Fiechter  
S2.5-O3 Activation of amorphous MoS<sub>x</sub> as a hydrogen evolving catalyst in aqueous electrolysis

#### WatSpl S2.6

Chair: Matthias May  
Room: Mediterraneo ABC

11:00 - 11:30 Krishnan Rajeshwar (*The University of Texas at Arlington*)  
S2.6-O1 New Families of Ternary Rare Earth Chalcogenides for Photoelectrochemical Applications

11:30 - 11:45 Wolfgang Schuhmann (*Analytical Chemistry-Center for Electrochemical Sciences (CES), Ruhr-Universität Bochum, D-44801 Bochum, Germany*), Ramona Gutkowski, Joao Junqueira, Tim Bobrowski, Olga Krysiak  
S2.6-O2 Improving the Photoelectrocatalytic Activity of Metal-Doped BiVO<sub>4</sub>-Based Photoabsorbers by Means of Oxygen Evolution Co-Catalysts

11:45 - 12:00 Sixto Gimenez Julia (*Institute of Advanced Materials (INAM), Universitat Jaume I, 12071 Castelló, Spain*), Miquel  
S2.6-O3 García-Tecedor, Drialys Cardenas-Moscoso, Roser Fernández-Cliiment  
Water oxidation with metal oxide semiconductor materials

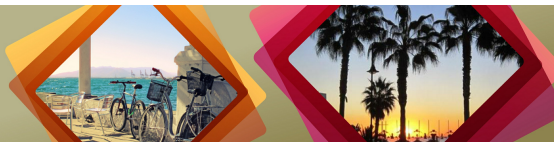
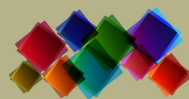
12:00 - 12:30 Bruce Parkinson (*Department of Chemistry, University of Wyoming, Laramie, WY, USA*)  
S2.6-O4 The Past, Present and Future of Solar Fuels

### Poster Contribution

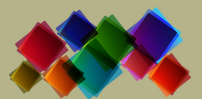
032 Jonathan Kampmann (*Ludwig-Maximilians-Universität (LMU) München*), Torben Sick, Alexander Hufnagel, Ilina Kondofersky, Markus Döblinger, Kristina Peters, Daniel Böhm, Dina Fattakhova-Rohlfing, Thomas Bein  
Conjugated 2D Covalent Organic Framework Thin Films as novel Absorber Material for Photoelectrochemical Hydrogen Evolution

037 Dennis Zywitzki (*Inorganic Materials Chemistry, Ruhr-University Bochum, 44801 Bochum, Germany*), Dereje Taffa, Jiyeon Kim, Michael Wark, Radim Beranek, Anjana Devi  
Vapor Phase Deposited Cobalt Oxide: A Highly Versatile Material System for Photoelectrochemical Water Splitting

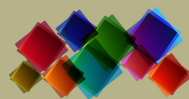
045 Katharina Welter (*Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research – 5 Photovoltaics, 52425 Jülich (Germany)*), Niloofar Hamzelui, Vladimir Smirnov, Jan-Philipp Becker, Wolfram Jaegermann, Friedhelm Finger  
Catalysts from Earth Abundant Materials in a Scalable, Stand-Alone Photovoltaic-Electrochemical Module for Solar Water Splitting



- 048 Ting Zhang (*Catalan Institute of Nanoscience and Nanotechnology (ICN2), CSIC and BIST, Campus UAB, Bellaterra, 08193 Barcelona, Spain*), PengYi Tang, JunShan Li, ZhiShan Luo, Yong Zuo, JunFeng Liu, Jordi Llorca, Andreu Cabot, Jordi Arbiol  
NiSn Bimetallic Nanoparticles as Stable Electrocatalysts for Methanol Oxidation Reaction
- 053 Thomas Teusch (*Carl von Ossietzky University Oldenburg*), Thorsten Klüner  
Adsorption and Dissociation of Water on Tungsten Trioxide (001)
- 057 Dereje Taffa (*Institute of Chemistry, Chemical Technology 1, Carl von Ossietzky University Oldenburg, Carl-von-Ossietzky-Str. 9-11, 26129 Oldenburg, Germany*), Sven Warfsmann, Michael Wark  
Stoichiometrically Varied Electrodeposited Ferrite Films for Photoelectrocatalytic Oxidation of Water
- 063 Swati Kumari (*Chair for MEMS Materials, Institute for Materials, Ruhr-Universität Bochum*), João R. C. Junqueira, Ramona Gutkowski, Aleksander Kostka, Katharina Hengge, Mona Nowak, Christina Scheu, Wolfgang Schuhmann, Alfred Ludwig  
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- 072 Hamidreza Hajiyani, Rossitza Pentcheva (*Department of Physics, University of Duisburg-Essen, Germany*)  
Role of surface orientation, termination and composition on the activity of  $\text{Co}_x\text{Ni}_{1-x}\text{Fe}_2\text{O}_4$  as an anode material for OER: insights from DFT+U calculations
- 101 João Ricardo Coelho Junqueira (*Analytical Chemistry – Center for Electrochemical Sciences (CES), Ruhr-Universität Bochum, Universitätsstr. 150, D-44780 Bochum, Germany*), Tim Bobrowski, Olga Anna Krysiak, Ramona Gutkowski, Wolfgang Schuhmann  
A Simple Method for Preparation and Optimisation of Mo-Modified  $\text{BiVO}_4$  Photoabsorbers and the Influence of Oxygen Evolution Catalyst Addition on the PEC Performance
- 102 Iwona Grądzka (*Faculty of Physics, Adam Mickiewicz University in Poznań, Umultowska 85, 61-614 Poznań, Poland*), Mateusz Gierszewski, Marcin Ziółek  
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Influence of Doped Tin Oxide Support on the Formation, Stability and Activity of Core – Shell Nanoparticles  $\text{IrCo}@\text{IrO}_x$  Catalyst for Water Splitting.



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- 284 Marc Widenmeyer (*University of Stuttgart, Institute for Material Science, Heisenbergstraße 3, 70569 Stuttgart, Germany*), Cora Bubeck, Alexandra T. De Denko, Frank Osterloh, Songhak Yoon, Anke Weidenkaff  
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[Mo<sub>3</sub>S<sub>13</sub>]<sup>2-</sup> and [Mo<sub>2</sub>S<sub>12</sub>]<sup>2-</sup> as Active Site Models for Amorphous Molybdenum Sulphides in HER-Catalysis
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