

US-German workshop series on artificial photosynthesis

Poster Session

03. November 2022, 17:00-19:00 CET

Space: gather.town

Chairs: Dr. Frances Houle (Lawrence Berkeley National Laboratory), Prof. Dr. Thomas Hannappel (TU Ilmenau)

TITLE / AUTHOR (INSTITUTION)

1 Reduction of crystal defects in GaP buffer layers grown on Si(100) by MOCVD

Manali Nandy,¹ [Kai Hanke](#),¹ Agnieszka Paszuk,¹ Markus Feifel,² Christian Koppka,¹ Peter Kleinschmidt,¹ Frank Dimroth,² Thomas Hannappel¹

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2 Preparation of P- and group III-rich GaInP (100) with subsequential H₂O exposure

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3 Chemical composition and band alignment at P-rich InP(100)/TiO₂ heterojunction

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4 Characterization of Proton Transfer Events Toward Solar Fuels Generation and Sensing of Local Proton Donors and Acceptors in an Aqueous Microenvironment

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5 Patterning of nanowire-based light absorbers for artificial photosynthesis

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6 Strategies for Breaking Molecular Scaling Relationships in Electrocatalysis

Daiki Nishiori, Edgar A. Reyes Cruz, Nghi P. Nguyen, Lillian K. Hensleigh, and Gary F. Moore
School of Molecular Sciences and The Biodesign Institute Center for Applied Structural Discovery, Arizona State University, Tempe, Arizona, U.S.A.

7 Degrade-Repair Cycle of a Fuel-Forming Photoelectrode

Nghi P. Nguyen, Lillian K. Hensleigh, Daiki Nishiori, Edgar A. Reyes Cruz, Gary F. Moore
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8 Generalized Determination of Diffusion Length from Photoconductivity Transients

Markus Schleuning^{1,2}, Moritz Kölbach¹, Ibbi Ahmet¹, Fatwa F. Abdi¹, Roel van de Krol^{1,3}, Klaus Schwarzburg¹, Rainer Eichberger¹, Dennis Friedrich¹, Hannes Hempel³

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9 Operando stability assessment in fundamental and high-throughput research for photoelectrochemistry

Ken J. Jenewein^a, Attila Kormányos^a, Dunwei Wang^b, Alfred Ludwig^{c,d}, and Serhiy Cherevko^a

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10 Electron dynamics at surface-modified photocathodes - Time-resolved two-photon photoemission spectroscopy of P-rich InP (100) surfaces modified with TiO₂

Diederich, Jonathan¹; Velázquez Rojas, Jennifer¹; Paszuk, Agnieszka²; Zare Pour, Mohammad Amin²; Ostheimer, David²; Rainer Eichberger²; Hannappel, Thomas²; van de Krol, Roel¹; Friedrich, Dennis¹

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11 Oxide-Encapsulated (Photo)electrocatalytic Materials

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12 Continuum Modeling of Metal-Insulator-Semiconductor (MIS) Photoelectrodes

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13 Membrane-free photoelectrochemical water splitting at elevated pressure: a model-based evaluation

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14 Accurate and Efficient Modern Correlated Wavefunction Methods for Predicting Multistate Reactivity in Artificial Photosynthesis

Maria Drosou, Dimitrios A. Pantazis

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15 Degradation of TiO₂-protected III-V water-splitting photocathodes induced by Pt-catalyst detachment

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16 Local pH isn't what you think it is - Interpreting the electrochemical potential of protonic species at ionomer-coated electrodes to optimize solar fuel reactivity

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17 Plasmonic Metal Nanoparticles / mesoporous TiO₂ composite for CO₂ photoreduction

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18 Accelerated screening of oxide semiconductors by combinatorial spray deposition and automatized analysis

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19 Challenges of using porous electrodes in solar water splitting devices for hydrogen production

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20 Computational approaches for Förster Resonance Energy Transfer in lipid bilayer membranes

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21 Understanding pH in nm-scale water pools

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22 Charge Injection Kinetics is Only the Beginning: Simulating and Quantifying Dye Performance under 1-Sun conditions

Thomas P. Cheshire^a, J a Boodry^{a,b}, Erin A. Kober^c, Ramzi Massad^a, Chenqi Fan^{a,b}, M. Kyle Brennaman^c, Paul G. Giokas^d, David F. Zigler^e, Andrew M. Moran^c, John M. Papanikolas^c, Gerald J. Meyer^c, Thomas J. Meyer^c, Frances Houle^a

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23 Photoelectrochemical study of powder-based BaTaO₂N photoanodes

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24 Transparent Thin Film Structured Catalysts for Electrochemical CO₂ Reduction via Glancing Angle Deposition

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25 Band energy diagrams of n-GaInP/n-AlInP(100) surfaces and heterointerfaces

Mohammad Amin Zare Pour¹, Oleksandr Romanyuk², Dominik C. Moritz³, Agnieszka Paszuk¹, Cl ement Maheu³, Sahar Shekarabi¹, Kai Daniel Hanke¹, David Ostheimer¹, Thomas Mayer³, Jan P. Hofmann³, Wolfram Jaegermann³, Thomas Hannappel¹

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26 P-terminated InP (001) surface defects and their effect on the electrochemical interface with water

Dominik Christian Moritz¹, I.A. Ruiz Alvado², M.A. Zare Pour³, A. Paszuk³, T. Frieß¹, E. Runge³, J.P. Hofmann¹, T. Hannappel³, W.G. Schmidt², W. Jaegermann^{1,3}

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27 Comparative Studies of Oxygen-free Semiconductors in Photocatalytic CO₂ Reduction and Alcohol Degradation

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28 Technoeconomically Viable Ensembles of Artificial Photosynthetic Nanoreactors for Z-Scheme Solar Water Splitting

Zejie Chen¹ (UCI), Univ. of Michigan, Columbia Uni., NREL, SNL, LLNL, LBNL, Tokyo University of Science, Shinshu University, Strategic Analysis Inc., et al.

29 Self-improved Photoelectrochemical Performance of Gd-doped Cu₃N Photocathodes in Aqueous Solutions

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30 Gas analysis for photoelectrochemical water splitting - Fast, reliable and affordable: The advantages of a mobile GC system

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31 Investigating large PEC cells with LED solar simulator technology

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32 Probing the degree of electronic coupling between molecular catalysis and conductive carbon support using X-ray absorption spectroscopy

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33 Ab-Initio X-ray Theory Distinguishes Photoexcited, Hot Electron, and Thermal Effects using Illuminated, Non-Time-Resolved Synchrotron Measurements

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34 Transparent Thin Film Structured Catalysts for Electrochemical CO₂ Reduction via Wet-Chemical Deposition Methods

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35 Ultrathin Oxide Membranes for Artificial Photosynthesis

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36 Towards using artificial photosynthesis in active matter

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37 Pre-equilibrium Hydride Formation by Cobalt Cluster Enhances Rate of CO₂ Reduction

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38 PET and Long-Lived Charge-Separated States Promoted by Intermolecular Interactions Between Copper(I) Diimines and Methyl Viologen

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39 Type-I hot carrier extraction in monolayer MoS₂ photoelectrodes

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40 Ruthenium (II) Polypyridines as Photosensitizers for Solar Cells: Characterization on TiO₂ (110) Surfaces

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41 Transport of Redox Shuttles in Microporous Silicon Oxide Films: Mechanistic Insights from Molecular Dynamics Simulations

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42 Understanding the Activity-Stability Relationship in OER Electrocatalysts

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