

Weimar 2016: Catalysis Strikes Back

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Reunion in Weimar

What a start to the year—the German Catalysis Society (GeCatS) gathered for their annual meeting, which is traditionally held in the historical city of Weimar. The city is situated in the heart of Germany and is well known for its cultural and historical impact on the nation's development throughout the centuries.

This year's 49th meeting took place from Wednesday March 16th to Friday March 18th and was attended by 535 participants (slightly fewer participants than previous years owing to a busy international conference timetable). Nonetheless, the scientific program was comprehensive and, as expected, set to a high scientific level, involving 5 plenary lectures, 31 presentations, and 269 posters on display. Special interest was recognized within these contributions in the fields of electrochemistry, selective oxidation/reduction, catalyst preparation, and selective (de-)hydrogenation. Moreover, YounGeCatS organized two poster workshops this year, in which attention was paid to ten selected poster contributions, mostly given by young scientists. The two poster workshops were dedicated to the topics of reaction engineering and molecular catalysis–biocatalysis, respectively. In addition to the scientific program, 27 companies were present to exhibit their latest products and innovations related to catalysis research and catalyst characterization throughout the conference. With 21 exhibitors in attendance the previous year, this significant growth clearly

demonstrates how fruitful the interaction is for industry and academia meeting in Weimar.

Highlights of the Conference

The opening day

Spotlight on Joachim Sauer (Humboldt Universität Berlin): Joachim is this year's François Gault Lectureship Awardee. His lecture was meant to open the conference, however, international flight schedules had their own opinion and in the spirit of the conference, this (reaction path)way seemed to have an activation barrier, which was rather high. Thus, an alternative route had to be found to avoid this rate-determining-step. In the meantime, Christophe Copéret (ETH Zürich) spontaneously filled in for him and gave his own plenary lecture on "Molecular Understanding and Controlled Functionalization of Surfaces towards Single-Site Catalysts". In this lecture, the methods to control and understand the chemistry at the surface of materials were discussed and interesting examples were presented on how dynamic nuclear polarization surface-enhanced NMR spectroscopy can provide insightful information about material active-site structures.

The following two sessions of oral contributions focused on computational methods for the design of molecular and supported catalysts, methane oxidation at low temperatures, ruthenium-catalyzed reduction, new approaches for in situ spectroscopy in gas/liquid-phase reactions, and in situ charge-carrier studies of ZnO catalyst supports. Subsequently, the poster workshops attracted a broad audience into the lecture halls and offered high-quality short presentations by young scientists. Discussions that were ignited during the workshops could then be continued and intensified during the first poster party in the evening.

Catalysis discovery on day two

Spotlight on Frank Glorius (Westfälische Wilhelms-Universität Münster): Frank's plenary lecture "On Discovery in Catalysis" opened the next day. The story of a little curious red dragon and his quest for the discovery of something new fascinated all conference attendees that morning. The presenter shared the little dragon's opinion on how it and other researchers would be able to discover novel catalysis and innovative chemical reactions by considering the potential activation of one substrate by a catalyst, rather than the mutual interaction of the substrates. A "Catalyst Speed Date" further illustrated this issue: Matthias Beller, the chairman of this session, and Udo Kragl were both "activated" by Frank Glorius, who represented



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the catalyst, and entered the front of the hall. Although, in principle, the catalyst activated both substrates the conditions under which the two reaction partners met were not suitable and the “couple” did not succeed.

After this very enthusiastic and inspiring lecture, the conference participants were motivated and ready for the remaining program of the day. The following parallel sessions were dedicated to homogeneous and heterogeneous catalysis. The former was hosted in the “Seminarhaus”, right next to the “Weimarhalle”, and the latter took place in the great lecture hall. Interesting discussions on the latest discoveries of catalysts and catalytic reactions picked up the thread of the morning’s plenary lecture.

The following lunch break in the exhibition floor of the Weimarhalle offered the opportunity for vivid discussions on catalysis, science, opportunities, and challenges and was supported by the lovely sunshine in Weimar that day. It was a rather enjoyable lunch time for everyone at the conference and was a great energizer for the second poster party.

After savoring regional specialties, the audience was looking forward to hear this year’s François Gault Lectureship Awardee Joachim Sauer (Humboldt Universität Berlin), who, no doubt, found an alternative (reaction path)way and overcame the required activation energy to deliver his fascinating plenary lecture on the “Support Effect on Oxide Catalysis: C–H Bond Activation on Vanadia/Ceria compared to Canadia/Silica”. In his splendid and authentic presentation, he provided a deep understanding of supported transition-metal oxides on an atomic level to bridge the gap between experimental studies on model catalysts and real catalytic systems.

Following this lecture, the two afternoon sessions took place in parallel and dealt, for example, with the conversion of biomass, amongst other fascinating catalytic topics, such as heterogeneous ethylene epoxidation on AgCu alloys and propane activation on nanostructured MnWO₄.

Later that day, it was time for the long-awaited and (now we can say) traditional career forum, successfully organized thanks to the YounGeCatS.^[1] A presentation about working in a trade association from Peter Sawinski (VCI) started this event and opened up a lively discussion afterwards. The possible interaction with representatives from five global chemical companies at their exhibition stands attracted many young chemists to gather information on future career opportunities.

The GeCatS party, the highlight of every “Weimar”-Thursday evening, was once more sold out and nicely rounded the whole day off. A great atmosphere resulted from the delicious buffet from the food market and the cold drinks available. The participants enjoyed themselves socializing, networking, and listening and dancing to live music.

Spotlight on the award ceremony: This year’s Otto Roelen Medal was awarded to Peter Strasser (Technische Universität Berlin, Figure 1). Peter Strasser was acknowledged for his discovery of highly active bimetallic core–shell catalysts for sustainable and cheap fuel-cell applications. Harun Tüysüz (Max-Planck-Institut für Kohlenforschung, Mülheim an der Ruhr, Figure 2) received the Jochen Block Prize for his outstanding



Figure 1. Peter Strasser (Technische Universität Berlin) is this year’s Otto Roelen Medal Awardee. Picture taken by Udo Kragl (Universität Rostock).



Figure 2. Harun Tüysüz (Max-Planck-Institut für Kohlenforschung, Mülheim an der Ruhr) received the Jochen Block Prize 2016. Picture taken by Udo Kragl (Universität Rostock).

research towards the development of nanostructured multifunctional materials for catalytic applications in the context of sustainable energy supply using sunlight. A total number of eight poster prizes were awarded this year, each worth 300€, to young researchers of diverse branches of catalysis. Furthermore, the best presentation from each YounGeCatS poster workshop was awarded a book prize, courtesy of Wiley-VCH. The prizes were awarded to Thomas Seidensticker (Technische Universität Dortmund) and Tobias Pogrzeba (Technische Universität Berlin) for their contribution to the sessions of molecular catalysis and reaction engineering, respectively (Figure 3).

The final day of the meeting

Spotlight on the morning after the party: The final day of the meeting started with the presentations given by the Otto Roelen Medal and Jochen Block Prize awardees. In his plenary talk, entitled “Electrocatalysis on Dealloyed Nanostructures”, Peter Strasser highlighted the excellent activity of bimetallic core–shell catalysts for the oxygen electrolysis in the application of fuel cells. He emphasized the enormous platinum savings when using bimetallic platinum core–shell catalysts in



Figure 3. The YounGeCatS poster workshop prizes were awarded to Thomas Seidensticker (Technische Universität Dortmund, center right) and Tobias Pogrzeba (Technische Universität Berlin, right), together with Claudia Ley (representing Wiley-VCH, left) and Mehtap Özasan (Universität Oldenburg, representing YounGeCatS, center left). Picture taken by Udo Kragl (Universität Rostock).

comparison to pure platinum-based fuel cells with identical performance and presented the first successful example for a fuel-cell car in which Pt–Co core–shell catalysts are already incorporated: the Toyota Mirai. The presentation given by Harun Tüysüz on “Nanoengineered Catalysts for Water Splitting” focused on hydrogen formation from water using photo- and electrocatalysis. He presented the results obtained in his group and how they are applying nanostructured multifunctional material in these reactions.

The following session was dedicated on new developments in the field of fuel cells, hydrogen and oxygen evolution as

well as electrocatalysis in general. The scientific program was completed with the talk “Energy Saving Chlorine Production with Gas Diffusion Electrodes” given by Jürgen Kintrup (Covestro Deutschland AG). He emphasized the economic and ecologic aspects of gas diffusion electrodes for the production of chlorine together with the current state of the art and new developments for this technology.

Finally, Martin Muhler (Ruhr-Universität Bochum), president of the German Catalysis Society, summarized the highlights of the conference, thanking the organizers and all participants. The 49th meeting was a successful conference with a comprehensive and interdisciplinary program, including excellent plenary lectures, oral, and poster presentations from all disciplines in catalysis and also provided various networking possibilities.

Celebrating the 50th Anniversary

Next year, the annual meeting of the German Catalysis Society celebrates its 50th anniversary. Renowned plenary speakers have already been announced for this special meeting. We can look forward to presentations from Alexis Bell, Matthias Beller, Robert Grubbs, and Can Li. Additionally, the Alwin Mittasch Prize will be awarded. The 50th annual meeting of the German Catalysis Society will take place from March 15th to March 17th 2017, in Weimar, where the tradition of advancing catalysis will continue.

[1] B. Engeldahl, M. Özasan, R. Marschall, M. Rose, S. Kaluza, J. Titus, C. Sprung, *ChemCatChem*, **2015**, *7*, 1794–1796.

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