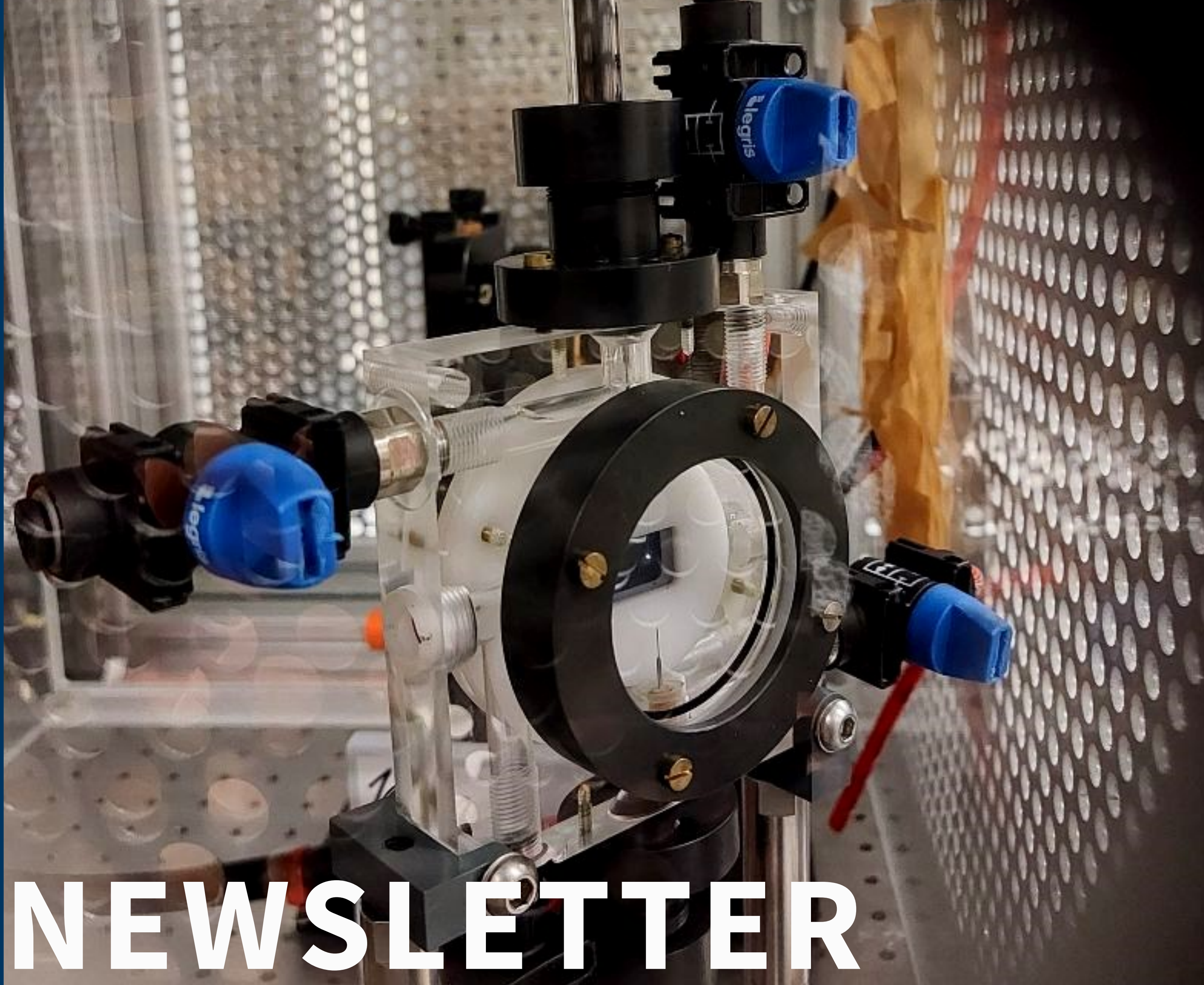


NEWSLETTER

EDITION 17 — 07/2024

SFB 1316 **Transient Atmospheric Plasmas**
from plasmas to liquids to solids

Content

Laura Chauvet left the CRC 1316

Dr Laura Chauvet has been working in the Experimental Physics II group since May 2018. She was part of the CRC 1316 project A3 with particular expertise in mass spectrometry.

Her training in physics with a Master's degree in physics in Toulouse was extended with a PhD on the *Experimental characterisation and optimisation of an atmospheric pressure plasma source coupled to a time-of-flight mass spectrometer*. After a postdoctoral phase at the Institut National Universitaire Champollion, she joined the Bochum plasma physics group.

Her primary research focus is on plasma physics, with a specific interest in plasma catalysis and the conversion of hydrocarbons at atmospheric pressure. Laura Chauvet has contributed significantly to the understanding of plasma catalytic processes, particularly through mass spectrometric measurements. For instance, she has investigated the plasma catalytic conversion of n-butane, highlighting the potential of plasma processes in chemical conversion and energy applications.

Furthermore, Laura Chauvet has been actively involved in international collaborations, such as the exchange program with the GREMI laboratory in Orléans, France. This project focuses on the role of carbon monoxide (CO) in the plasma treatment of biological substrates, exploring how CO and other plasma-produced species interact and affect biological materials.

Laura was also part of the EP2 group, in which she not only found scientific colleagues, but also many friends with whom she undertook many different activities, such as bouldering. She not only took part in the events, but also helped with the organisation, such as the film night.

Unfortunately, she has now left Bochum and will pursue her professional career in France. We wish her all the best for her future!

We will miss you <3

EP2 members & former members

Andrew Gibson took over a lecturer position in York, UK

Prof. Dr. Andrew Gibson was a respected assistant professor at the electrical engineering faculty at Ruhr-Universität Bochum from October 2018 until February 2024. His research focused on the simulation of plasma chemistry for atmospheric and low-pressure plasmas, with applications in biomedical fields, gas cleaning, and photon sources, particularly for sterilization. During his time at RUB, Andrew made significant contributions to various key projects, including the Collaborative Research Centre CRC 1316, PlasNOW, and MoPlas2Dekon-Pro. He was instrumental in acquiring important research equipment, such as a 20 m FTIR Multi-Path Gas Cell and a Quantel OPO Laser.

Andrew was also praised for his teaching. His course, Biomedical Applications in Plasma Technology, was very popular and attracted a broad audience, including students from Dortmund and other disciplines. Known for his motto, "Quality over quantity," Andrew ensured meticulous and high-standard work. His accuracy often led him to plan everything down to the last detail, a characteristic feature that added a humorous touch to his persona within the team.

Outside of work, the team had a tradition of enjoying beers or whiskey together on Fridays after work, often visiting the Bermuda Triangle in Bochum for some bratwurst and camaraderie. Andrew was a big fan of the Bratwursthaus, a local highlight. These social gatherings fostered a strong sense of community and camaraderie within the team.

Andrew has now moved to York, where he has taken up a position as a lecturer. Andrew's departure is a significant loss for the Bochum plasma groups, but we are proud of his achievements and wish him the best in his new role in York.

Lars Schücke and colleagues from AEPT

New project B15 in the CRC 1316 granted: plasma-induced photocatalysis

The German Research Foundation (DFG) has granted a new project to Prof. Dr. Bastian Mei from the Ruhr University Bochum (RUB) chemistry department. The new project will investigate the plasma-assisted modification of semiconductor particles, which is regarded as an emerging approach to modify their surface and bulk properties, thereby enhancing their catalytic performance in light-driven processes, including reactions of high relevance such as the removal of volatile organic compounds (VOC).

The plasma-assisted processing method primarily involves the treatment of nanoparticulate ferroelectric materials using a combination of corona discharges and plasma processing techniques, including dielectric barrier discharge (DBD) plasmas in the liquid or gas phase, in order to induce the formation of shallow-level defects while maintaining the structural and chemical integrity of the semiconductor substrate.

It is postulated that plasma-treatment strategies offer advantages over conventional treatment strategies for metal oxides, including doping by foreign elements or high-temperature treatment. Despite the generally observed positive impact of plasma treatments on the (photo)catalytic performance, systematic investigations of plasma-induced surface modification and doping processes are yet to be reported.

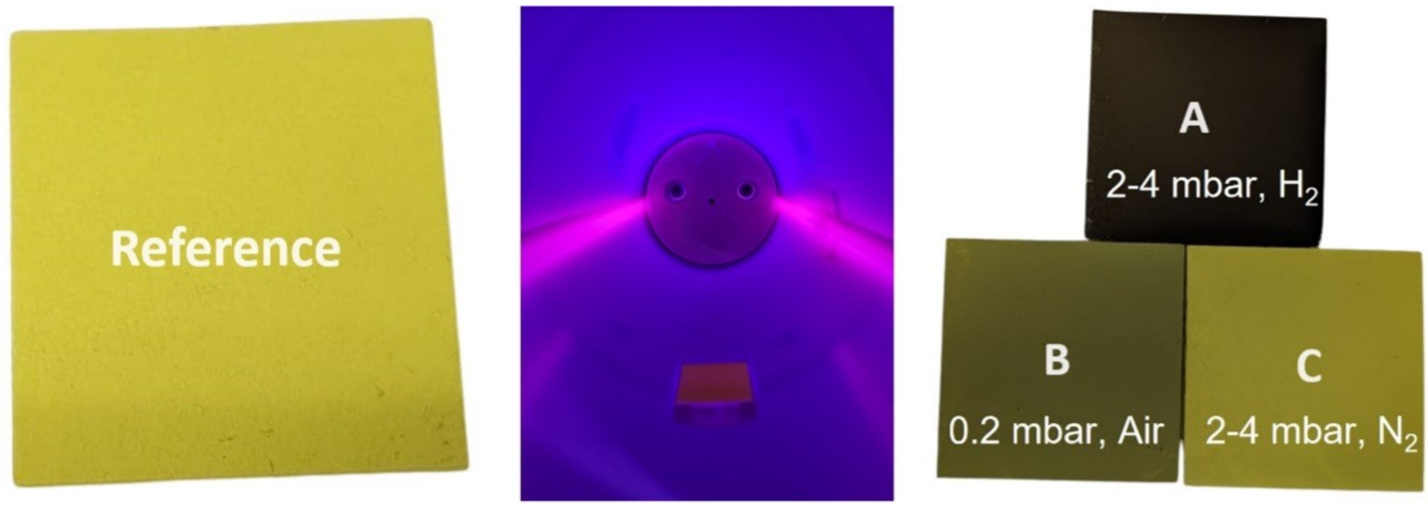


Figure 1: Schematic illustration of pristine and plasma treated $BiVO_4$ spray coated on a pre-cleaned glass substrate. Plasma treatments were performed in a Diener Zepto low-pressure plasma chamber at 100 W using the gas atmospheres indicated above.

B15 thus aims to correlate plasma properties and characteristics of the (photo)catalytic materials. Well-characterized plasma sources will be used for functionalization, and strong collaboration within the interdisciplinary consortium will be fostered to enhance the fundamental understanding in this emerging field.

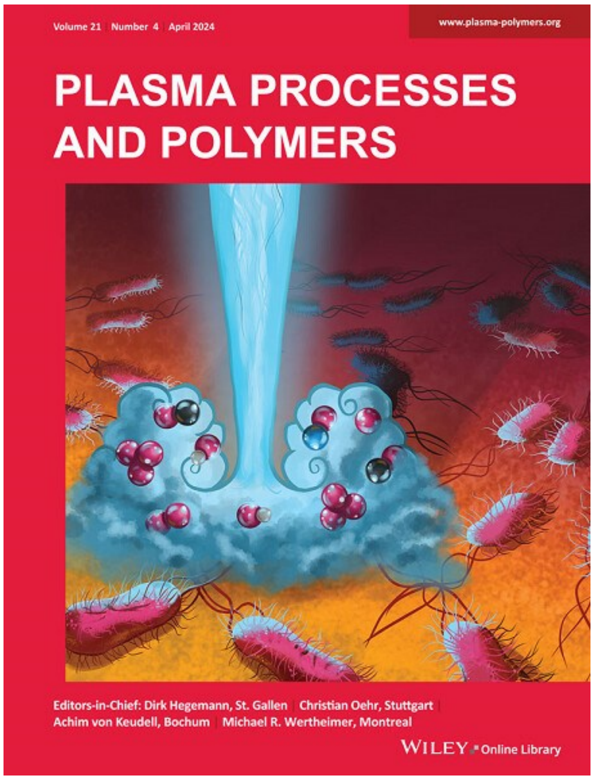
Bastian Mei, project B15

Cover on Plasma Processes and Polymers

The paper '*Comparison of CO production and Escherichia coli inactivation by a kHz and a MHz plasma jet*' by Eloise Mestre, Inna Orel, Daniel Henze, Laura Chauvet, Sebastian Burhenn, Sebastien Dozias, Fabienne Brule-Morabito, Judith Golda and Claire Douat made it onto the cover of the renowned journal Plasma Processes and Polymers, Volume 21, Issue 4.

The picture was created by Claire Douat, one of the authors, who contributed her creative skills here.

Plasma Processes & Polymers focuses on the interdisciplinary field of low temperature plasma science, covering both experimental and theoretical aspects of fundamental and applied research in materials science, physics, chemistry and engineering in the area of plasma sources and plasma-based treatments.



Congratulations to the authors!

Lara Boeddinghaus, public relations

SOWAS project within CRC 1316

Student internships (also known as SOWAS in Bochum) deal with research-related issues and are part of the training programme and are also part of research.

As part of a SOWAS project in the CRC 1316, the electrical charges of the COST jet were investigated using a platinum probe. For the measurements, a platinum wire was inserted into a glass capillary and the currents were measured both in the outlet and in the outflow.

A slightly oval-shaped profile of positive charges was measured, the intensity of which decreases with increasing distance. This profile changes to a ring as soon as the wire is drawn into the capillary. A visible minimum appears close to the opening of the jet.

An admixture of oxygen or water reduces the intensity, which increases with increasing power coupling. Shortly before entering the discharge, the current on the probe reach its maximum and falls rapidly into the negative during the discharge. Other parameters such as oxygen admixture and power variation were measured, but an exact interpretation of the results is difficult due to the lack of reproducibility of the measurement results in the discharge itself.

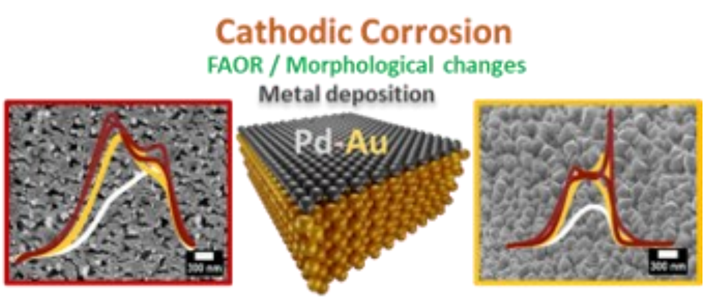
Lennart Kulik and Jannis Kaufmann

Metal deposition and electrocatalysis for elucidating structural changes of gold electrodes during cathodic corrosion

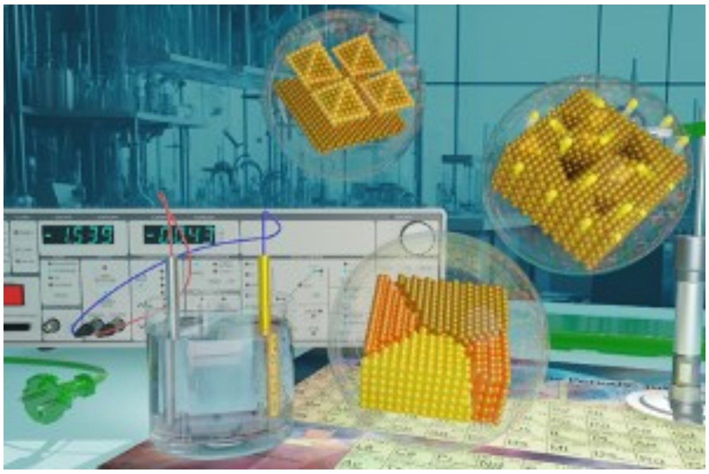
Mohamed M. Elnagar, Ludwig A. Kibler, Timo Jacob

Electrochemical conversion reactions, such as alkaline water electrolysis for hydrogen production, electroreduction of CO_2 to hydrocarbons, N_2 reduction reaction, and oxygen reduction reaction, occur in the presence of alkali metal or organic cations at high cathodic current densities. This environment can induce significant alterations in the electrocatalyst's surface structure, including changes in roughness, morphology, grain boundaries, crystal orientation, and surface defects, a process known as cathodic corrosion. Understanding these transformations is critical for developing durable and effective electrocatalysts, especially for advancing green technologies.

In our recent study, we systematically explored how metal surfaces undergo structural changes during cathodic corrosion. We used structure-sensitive electrocatalytic reactions (formic acid oxidation (FAOR) and hydrogen evolution (HER)) along with metal underpotential deposition (lead and palladium). In order to foster the cathodic corrosion process, we polarized the gold surfaces at various negative potentials for 60 seconds in 10 M KOH or NaOH solutions.



Our studies reveal that cathodic polarization induces significant changes in surface morphology, crystallographic orientation, and the electrochemically active surface area (EASA) of gold electrodes, profoundly impacting their electrochemical behavior and catalytic performance. Similar modifications can also be observed after a plasma-treatment of the electrode. Notably, cathodic polarization in concentrated NaOH and KOH electrolytes leads to an enrichment of (111)-facets, albeit to varying extents. Pb UPD analysis shows that Au electrodes polarized in KOH exhibit wider (111)-domains and a more single-crystalline nature compared to those polarized in NaOH.



Distinct active sites formed during cathodic corrosion were identified through studying FAOR and HER. The FAOR activity of the cathodically-corroded Au electrode, with a maximum contribution of (111)-facets, closely resembles that of well-defined Au(111) single crystals. Conversely, the HER activity of these corroded Au electrodes is significantly enhanced compared to both as-polished and single-crystal Au electrodes. Remarkably, nano-structured Au electrodes formed in NaOH exhibit superior HER activity, highlighting the role of low-coordination sites in HER.

Furthermore, we were capable to generate Pd–Au bimetallic nanostructures to boost catalytic activity, demonstrating superior performance for FAOR in $HClO_4$ and H_2SO_4 solutions compared to conventional electrodes.

Our findings provide deep insights into the structural transformations expected at cathodes under highly reducing conditions. As the origin of these changes traces back to similar processes occurring during an anodic and cathodic plasma treatment, the cathodically corroded systems might serve as a framework for understanding even plasma-induced structural changes. Additionally, cathodic corrosion emerges as a promising, cost-effective, and eco-friendly technique for synthesizing catalytically active low-dimensional materials for a wide range of technological applications.

View paper

Mohamed M. Elnagar, project B4

Research Stay at Instituto Superior Técnico, Portugal

As part of his PhD, Christian Busch (project A2) spent six weeks at the Instituto Superior Técnico in Lisbon, Portugal. There, he worked together with the group of Prof. Vasco Guerra on the simulation of the vibrational kinetics of CO_2/N_2 mixtures in a

nanosecond pulsed discharge using the LoKI simulation codes developed in Lisbon. The aim of this collaboration is the comparison of the models with experimental results obtained in project A2. The novelty behind the nanosecond pulsed discharge is that it allows for the temporal separation of different vibrational energy transfer processes and thus enables their independent study.

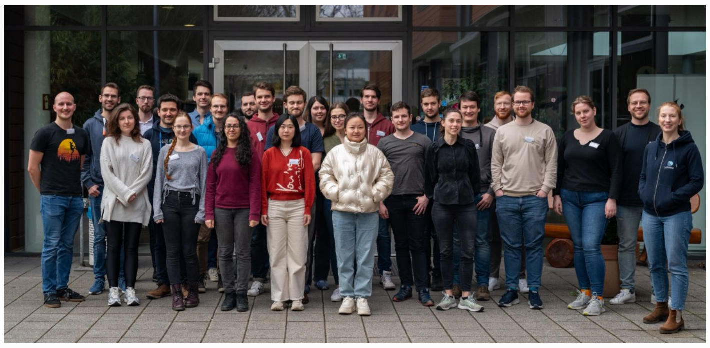
The work carried out in Lisbon on the validation of kinetic schemes highlighted two aspects. Firstly, several processes are not reproduced well by commonly applied scaling laws. Secondly, the comparison between the experiment and the model revealed that there are processes that are not considered in the model so far. One such process was theorized to be a vibrational energy transfer from N_2 to multiple vibrational modes of CO_2 and not only the asymmetric mode as considered initially.

Open questions from the collaboration also serve as a guide for the selection of experiments and measurements that will be performed in the future to answer these questions.

Christian Busch, project A2

MGK spring meeting

The MGK Colloquium 2024 of the CRC 1316 took place from February 21th to 23rd in Heidelberg. The colloquium is intended as a casual meeting where the young researchers of the CRC 1316 can come together and exchange their knowledge.



The meeting began with a guided tour through Heidelberg Castle. During the 90-minute tour, the participants learned a lot about the history of Heidelberg and the castle. On Thursday and Friday, the scientific part took place at the DJH Jugendherberge Heidelberg. Each student presented their progress in project presentations and two poster sessions.

As an invited speaker from the "Laboratoire de Physique des Plasmas" in Palaiseau, France, Maik Budde gave a scientific lecture on CO_2 conversion. In addition, speakers from large companies such as the Hartmann Group, ASML and Zeiss, as well as from a start-up company, Lidrotec, were invited to present their companies and explain how they got to their current positions after completing their PhD. Overall, the MGK Colloquium was a very successful conference and fostered exchange and communication between the young researchers of CRC 1316.

Steffen Schüttler, project B11

DPG spring meeting

From February 26th to 29th, the CRC 1316 participated in the DPG Spring Conference in Greifswald, featuring four invited talks, numerous regular presentations, and engaging poster sessions. Our community was actively involved, with one member serving on the Advisory Board for Plasma Physics of the DPG.

EP2 group

The conference provided a platform for networking and collaboration with researchers from the German Physical Society (DPG). Attendees exchanged ideas, perspectives, and expertise, enriching the scientific dialogue and fostering camaraderie among the scientific community.

AEPT group

Alongside intensive discussions on current research results, participants had the opportunity to visit and tour the renowned Wendelstein 7-X fusion research reactor.

Martha Finke, public relations

IWM 12 in Orleans, France

The 12th International Workshop on Microplasmas in 2024 has been held in Orléans, France, from June 3rd to 7th. One Invited, five contributed talks, and two posters were presented by scientists from Ruhr University Bochum.

The workshop covered wide topics on microplasma sources and their generation in the gas phase or liquid and their interfaces. Further, diagnostics of microplasma sources and their application in material processing, plasma medicine, agriculture, etc were presented. The modeling section covered research and on numerical simulation of streamer dynamics to the 0D Global kinetic models.

Soad Mohsenimehr , project A3

15th Frontiers in Low-Temperature Plasma Physics

From April 29th until May 2nd, members of the Department of Pulsed Plasma Systems from the Institute of Plasma Physics of the Czech Academy of Sciences in Prague, Czech Republic hosted the 15th Frontiers in Low Temperature Plasma Diagnostics Workshop (FLTPD XV) in Liblice, Czech Republic.

This biannual workshop was attended by members of the CRC 1316 to connect with other researchers working in low-temperature plasma diagnostics. Over the course of four days, lectures covered recent advancements and results of a variety of diagnostic techniques such as emission spectroscopy, electrical measurements, LIF & TALIF, cavity ring-down spectroscopy, EFISH and many more. Additionally, two poster sessions were held, providing further opportunities for discussions.

Pia Pottkämper, project B7

Spatio-temporal dynamics of electrons and helium metastables in uniform dielectric barrier discharges formed in He/N_2

Niklas Nawrath, Ihor Korolov, Nikita Bibinov, Peter Awakowicz and Andrew R Gibson

Excited species are effectively produced by atmospheric pressure non-thermal plasmas for various applications. In general, the outcome of the application is defined by the fundamental plasma properties like the reduced electric field E/N , the electron density n_e as well as the gas temperature T_g, while these parameters can be influenced by the operating conditions of the plasma source, like gas composition and ignition characteristics. To better understand these parameters at atmospheric pressure, high temporal and spatial resolution is required.

In the presented paper, E/N as well as are investigated in a dielectric barrier discharge (DBD) operated in helium with 0.45% nitrogen admixture using an absolutely calibrated camera for emission spectroscopy at 380 nm and 390 nm in combination with a collisional radiative model (CRM). The temporal development of the discharge was scanned using a delay generator that triggered the camera. Due to low emission intensity, multiple images are averaged to produce a single one. In contrast to filamentary DBDs, where averaging would produce errors, the helium DBD was diffuse and highly reproducible. Therefore, averaging across multiple images at the same time delay is possible without introduction of averaging errors. The acquired images are processed to convert the measured projection on the CCD chip to radially resolved emission by an inverse Abel transform. The emission intensities of N_2(C-B,0-0) and N2+(B-X,0-0) are used to simultaneously solve a system of two equations to calculate the reduced electric field and electron densities with high spatial (~15 µm) and temporal (40 ns) resolution.

The data allow us to characterize the discharge development in two sequences with 3 and 6 images in the first and second half wave of the ignition, respectively. Figure 1 shows the start end of the first sequence. Analyzing the electron density distribution and the reduced electric field, it indicates that the plasma in the discharge gap has a very small lifetime compared to the discharge developing at

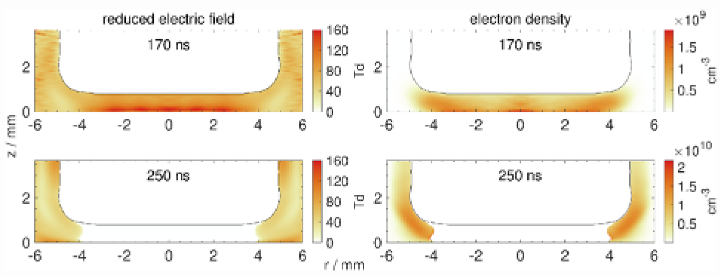


Figure 1: Reduced electric field (left column) and electron density (right column) determined in the helium DBD with an admixture of 0.45% nitrogen at 170 ns (top) and 250 ns (bottom). Temporal resolution amounts to 40 ns. The black contour line shows the outline of the electrode. Figure taken from summarized paper.

the lateral surface of the driven, cylindrical electrode, where the discharge expands to a larger size. At the same time, the maximum electron density is approximately one order of magnitude larger at the lateral surface ($\approx 1.5 \cdot 10^{10}$ m^{-3}). compared to the one in the gap ($\approx 1.5 \cdot 10^{9}$ cm^{-3}).

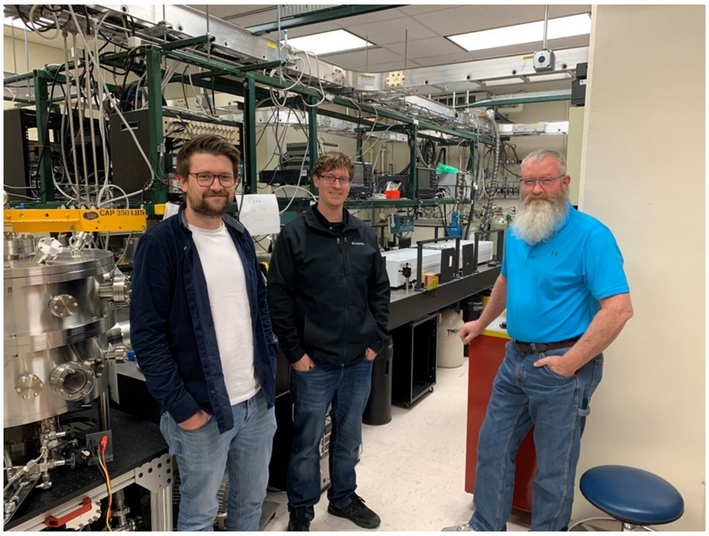
Further, by using the final values of the model and rate coefficients of the production of several excited helium states, a total helium metastable density is calculated. At the same time, the density of He (2^3S) is measured using tunable diode laser absorption spectroscopy (TDLAS). Based on the assumption that a large quantity of the excited helium atoms will relax into $He(2^3S)$, the estimated total helium metastable density could be a good estimate for the density of $He(2^3S)$. To allow the comparison of the time resolved TDLAS measurement and the time and space resolved results of the CRM, these values are line integrated using the forward Abel transform and afterwards averaged at the corresponding region of interest. The good agreement of both methods allows us to assume that the effective helium metastable density is a reasonable estimate for the density of $He(2^3S)$.

Niklas Nawrath, PlasNOW and CRC 1316 project A5

Research stay in Albuquerque by David Steuer

As part of a Plasma Research Facility (PRF) project, I had the opportunity to conduct measurements for my PhD thesis in Albuquerque. After submitting a proposal and undergoing a successful review process, the project was carried out on-site. The trip was funded by the Research School of Ruhr University Bochum through the PRINT program, as well as by the CRC 1316.

The goal of the project was to determine atomic oxygen densities within a micro-cavity plasma array using two-photon absorption laser-induced fluorescence (TALIF). A state-of-the-art picosecond laser was used for this purpose. With this setup, it was possible to measure 2D-resolved absolute oxygen densities. The results show that atomic oxygen can still be detected several millimeters above the cavities. This could be very useful for plasma catalysis applications, as a large gas volume can react with atomic oxygen, and (catalytic) surfaces can be treated. Furthermore, as shown in previous studies, the discharge characteristics of the array strongly depend on the gas composition used. For example, the produced atomic oxygen density per cavity initially increases with higher oxygen admixture. However, due to the changed ignition criteria, the number of ignited cavities decreases, making the array overall less efficient. In the future, this knowledge can help to adapt the design of the reactor with regard to its conversion efficiency.



David Steuer, Brian Bentz and Kevin Youngman

Overall, the stay can be considered a great success. The scientific results significantly enhance the understanding of micro-cavity plasma arrays, bringing the project closer to the ambitions of plasma catalytic applications and directly contributing to the goals of CRC 1316. Additionally, I gained valuable insights for my PhD thesis, get into conteact with a new (work) culture, made international contacts, and improved my language skills.

Ammonia synthesis by plasma catalysis in an atmospheric RF helium plasma

Steijn Vervloedt and Achim von Keudell

The ongoing energy transition introduces a mismatch between the supply and demand of electricity. Plasma based reactors could tackle this intermittency issue by using excess renewable energy to synthesise value added chemicals or to store this excess energy in chemical bonds. Within the A3 project of the CRC 1316 collaboration, we perform fundamental studies on the plasma based gas conversion. This is done in a simplified plasma-environment that is created in an atmospheric helium RF discharge.

In our recently published article, the in-plasma-catalytic synthesis of ammonia from nitrogen and hydrogen admixed to a helium RF plasma is studied with infrared absorption spectroscopy, optical emission spectroscopy, and through chemical kinetics modelling. Sandblasted glass is used as support for iron, platinum, and copper catalysts up to a surface temperature of 150°C. The ammonia is measured ex-situ with Fourier transform infrared absorption spectroscopy. The scaling laws for the electron kinetics are estimated by tracking the emission bands of N_2 and N^+_2. These are used in the kinetic model to reproduce the measured concentrations. From this model, we can track the formation pathways and the influence of the surface chemistry on the overall process. In figure 1, a graphical overview is given for the included processes. Following earlier studies, the introduction of a metallic coating is considered by changing the sticking coefficients and diffusion energy barriers for the respective Eley-Rideal and Langmuir-Hinshelwood surface reactions.

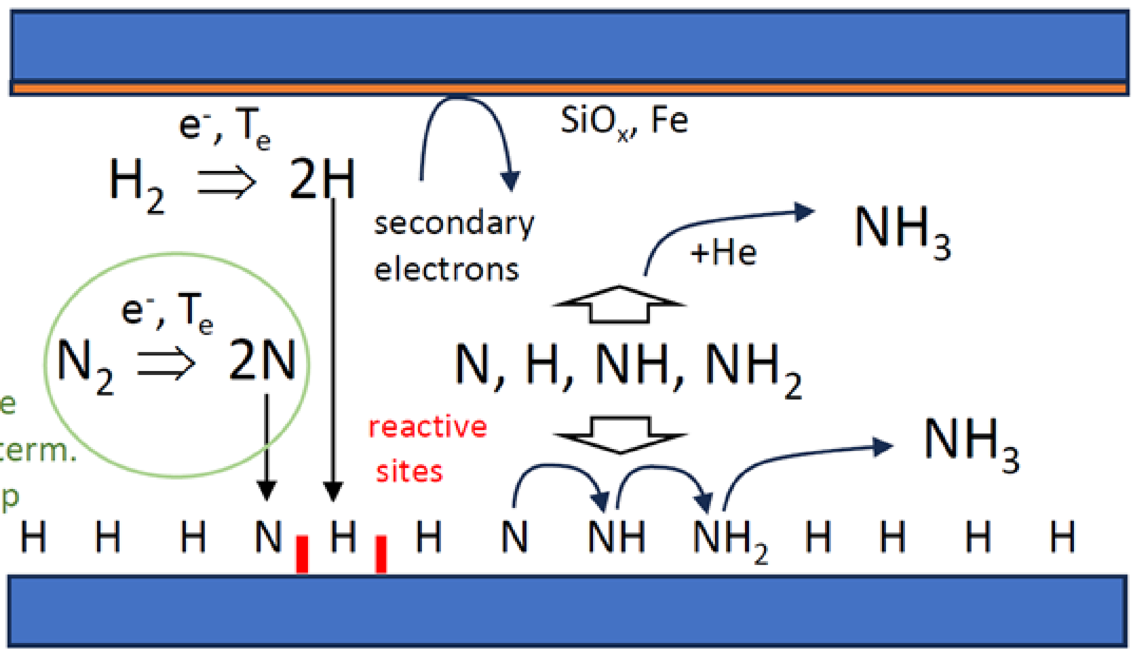


Figure 1: An overview of the reaction that are considered by the kinetic model. The plasma is considered through electron impact dissociation processes that trigger the formation up to NH_3 in both the gas phase and on the surface.

It is shown that the optimum ammonia production occurs at very small $N_2/(N_2+H_2)$ ratios with an increase of concentration with the N_2+H_2 admixture and the plasma power. The global kinetic modelling agrees well with the data for a variation of the N_2+H_2 admixture and the absorbed plasma power. The introduction of the catalyst enhances ammonia production, where an relative increase up to a factor of 2 is observed. According to the model, this increase is ascribed to a more beneficial electron kinetics. It is postulated that introducing the catalyst increases the reduced electric field, because it reduces the secondary electron emission coefficient. As a result, the dissociation of N_2 is stimulated, thereby enhancing the NH_3 formation.

With the results presented in this article, we try to shed light on the topic of whether introducing a catalyst directly enhances the chemistry – e.g. through lowering activation energy barriers – or that it affects the plasma kinetics; thereby possibly the chemistry as well. In our atmospheric noble gas based plasma, we find that the latter is the more likely explanation for the observed increase in the NH_3 production.

Steijn Vervloedt, project A3

[1] Steijn Vervloedt and Achim von Keudell, Plasma Sources Sci. Technol. 33 (2024) 045005. doi: 10.1088/1361-6595/ad38d6

View paper

3rd Workshop on FAIR data in plasma science

Between May 13th and 14th, Kiel University hosted the third workshop on research data management in plasma science. This event was a collaborative effort, jointly organized by the INP Greifswald, Kiel University, and the University of Bochum. The workshop attracted a diverse audience, with 19 participants attending in person and approximately 30 joining online, eager to delve into the latest advancements and discussions in the field.

The workshop included different talks from researchers, facilitating a rich exchange of ideas and knowledge. Participants had the opportunity to explore various aspects of research data management.

This year's workshop placed a particular emphasis on electronic labbooks. A dedicated hands-on session provided participants with practical experience, demonstrating how electronic labbooks can seamlessly integrate with both simulation research and experimental work. This approach not only highlighted the advantages of digital tools in managing research data but also fostered a deeper understanding of their application in real-world scenarios.

© CAU, Kiel

Marina Prenzel, project INF

Plasma in Liquids induced modification of Cu surfaces

Pia Pottkämper and Achim von Keudell

Recently a paper regarding the topic of in-liquid plasmas titled "Plasma in Liquids induced modification of Cu surfaces" was published in the Journal of Physics D: Applied Physics by our group. In the paper the influence of the in-liquid plasma and of the plasma activated water (PAW) on copper surfaces is presented. An application of copper oxide surfaces is the catalysis of the CO_2 reduction reaction. The catalysts activity vanishes during this reaction and they need to be reactivated. In the paper, the in-liquid plasma was examined as a potential tool for generation and reactivation of such catalytic surfaces. It was shown that the plasma causes a reduction of the surface on short timescales, the PAW however is able to oxidize copper and cause the formation of preferentially oriented copper oxide nanocrystals. Both oxidation and reduction were found to co-occur during the surface treatment.

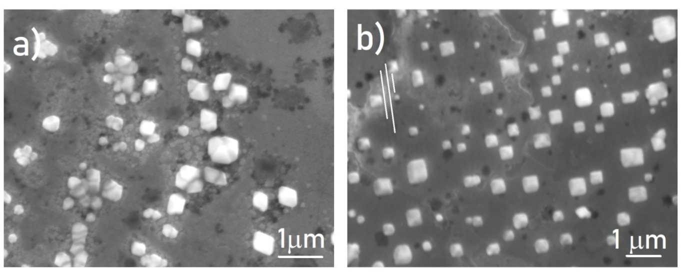


Figure 1: SEM analysis of a 50 nm Cu film after treatment with (a) distilled water and (b) plasma-activated water generated at +20 kV at 10 Hz for 20 min treated for 4 h.

Based on the results of both in situ FTIR measurements and ex situ XPS and SEM measurements a model for the oxidation process of the copper surfaces by the plasma activated liquid was established: The copper surface oxidizes upon contact with humid air and the liquid before plasma ignition. In the first step of plasma-surface-interaction the plasma induces the water splitting reaction of the liquid which ultimately results in the production of H_2O_2. When in contact with the copper, an oxidation reaction occurs and CuOH molecules form and dissolve into the liquid.

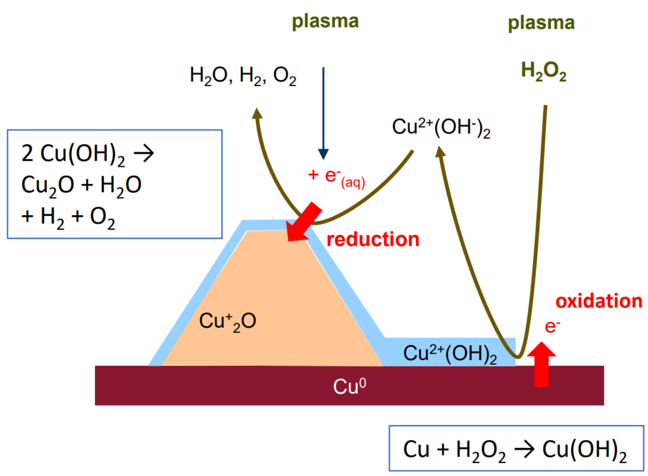


Figure 2: Schematic reactions at the copper surface in the plasma-in-liquid system.

In the next step, the electrons dissolved in the liquid produced by the plasma cause a reduction of the CuOH and Cu_2O forms. Lastly this process repeats, resulting in the growth of the observed oriented nanocubes. This is a slow process since nanocubes could be observed after treatment times of a few hours.

Pia Pottkämper, project B7

[1] Pia Pottkämper and Achim von Keudell, J. Phys. D: Appl. Phys. 57 (2024) 345201. doi: 10.1088/1361-6463/ad4b2d

View paper

Public relations activities

Two successful public relations formats were organized in 2024.

During the first week of the Easter break, an exciting project week full of physics and research took place in the Alfried Krupp student laboratory of the Ruhr University Bochum. In addition to interesting workshops and experiments on plasma physics, astronomy and physics in medicine, the female high school students from grade 8 to 10 attended a lecture by Dr Niklas Fornefeld on "Thermal radiation 'Is light light?' - From sunburn to trash TV". The girls also experienced current research in laboratory tours and travelled through space in the Zeiss Planetarium Bochum.

On 20th February, a study orientation day for engineering studies, took place at the Ruhr University and Bochum University of Applied Sciences, the BO.Ing. High school students attended a lecture in physics, were guided through laboratories, and could participate in exciting workshops.

The Faculty of Electrical Engineering and the Faculty of Physics organised a workshop on plasma physics. The high school students learned a lot about plasmas and their applications. They coated samples using the sputter coater and analysed the properties of the produced gold layers.

Ida Hülsbusch, public relations

Visit of Renato Montagnolli

Prof. Renato Montagnolli, a researcher from São Paulo State University, enriched our Collaborative Research Center with his visit from March 8th to March 19th. Professor Montagnolli's visit was made possible by a Research School Travel Grant, and co-funded by the Collaborative Research Center 1316. The main focus of his trip was to plan a joint project aimed at developing "green" pathways of protein immobilization for our plasma-driven biocatalysis.

During his stay, we had the opportunity to present our biocatalysis setup to Professor Montagnolli and demonstrate the whole process from protein purification to protein application under plasma. This interaction allowed us to jointly plan and refine important steps for the effective implementation of our project.

Another aim of his visit was to promote collaboration with future scientists. For this reason, we also targeted Bachelor students to raise awareness of the opportunities within the CRC. The CRC funding offers the chance for one person to go to Brazil for several months to test the various immobilization techniques and bring a fruitful exchange between the Research Centers.

Lara Boeddinghaus, public relations

IMPRESSUM

Public relations CRC 1316

Sebastian Belzer, Lara Boeddinghaus,
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