International Low Temperature Plasma Community

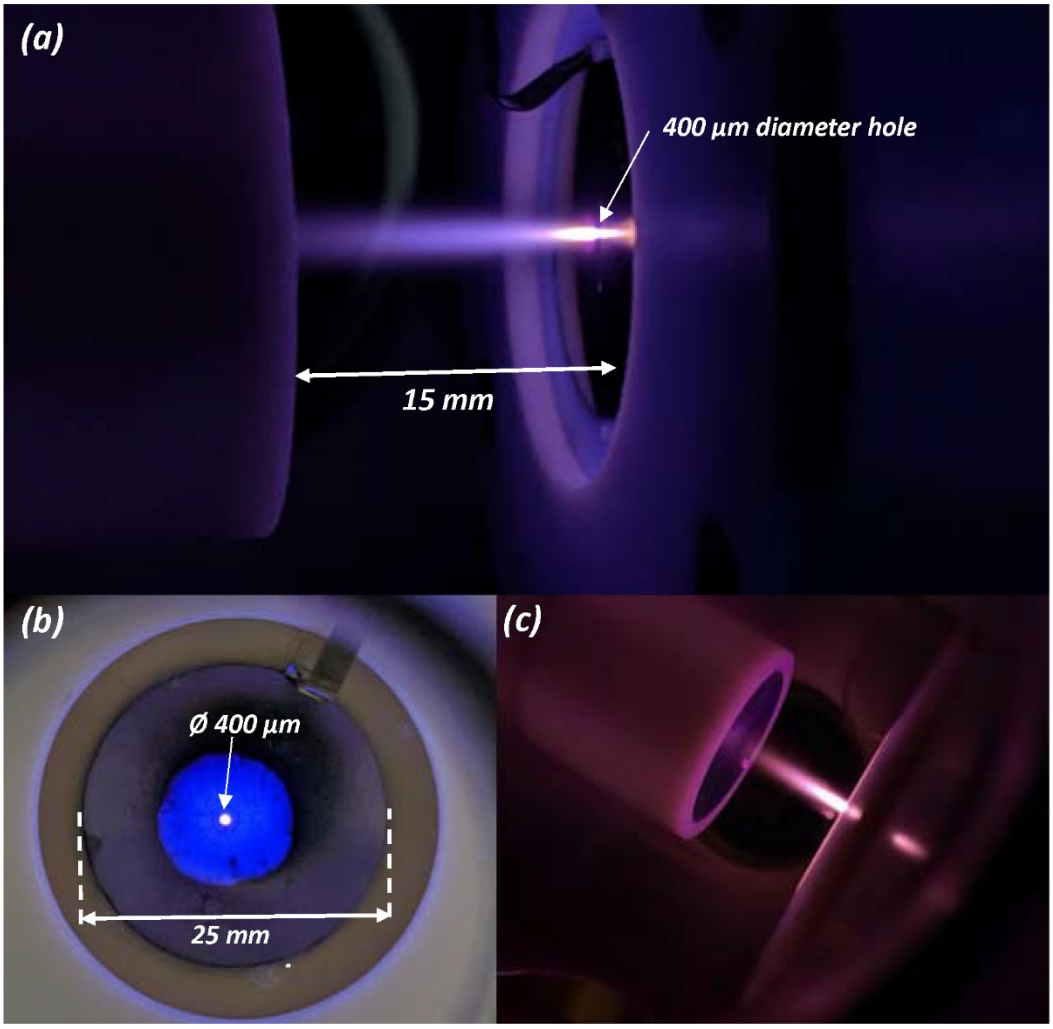
https://mipse.umich.edu/iltpc.php, iltpc-central@umich.edu

Newsletter 35

27 September 2023

Images to Excite and Inspire!

Please send your images (with a short description) to iltpc-central@umich.edu. The recommended image format is TIF, JPG, or PNG. The minimum file width is 800 px.



Micro-Hollow Cathode Discharge (MHCD): We present images of a direct current MHCD ignited in a 400-µm-diameter hole (drilled in a *Mo/Al$_2$O$_3$/Mo* sandwich structure) sustained in Ar/N$_2$ mixtures. The MHCD sandwich is placed between two chambers maintained at different pressures: 50 mbar on the cathodic and 10 mbar on the anodic sides. This condition forms a plasma jet several cm in length (**Figures (a) and (c)**; anodic side). The plasma jet impinges on a metallic surface which mimics a substrate holder when using the MHCD for material deposition (hexagonal boron nitride in our case). **Figure (b)** shows the cathodic side of the MHCD structure where the cathodic expansion, typical of a MHCD, is observed (not affected by the pressure difference). This MHCD configuration can be used as a source of atomic nitrogen, taking advantage of the very high power density (up to 100 kW.cm^{-3}) which enables efficient dissociation of N$_2$. The nitrogen atoms are transferred to a remote substrate by the plasma jet. **Dr. Alice Remigy** (alice.remigy.pro@gmail.com), **Prof. Guillaume Lombardi** (guillaume.lombardi@lspm.cnrs.fr), **Dr. Kristaq Gazeli** (kristaq.gazeli@lspm.cnrs.fr) and **Dr. Claudia Lazzaroni** (claudia.lazzaroni@lspm.cnrs.fr), Université Sorbonne Paris Nord, France.

In this issue:	
• Images • Call for Contributions • LTP Perspectives • Leaders of the LTP Community • General Interest Announcements	• Meetings and Online Seminars • Community Initiatives, Special Issues • Research Highlights, Breakthroughs • New Resources • Career Opportunities • Collaborative Opportunities

Call for Contributions

Please submit content for the next issue of the Newsletter. Please send your contributions to iltpc-central@umich.edu by **October 27, 2023.** Please send contributions as MS-Word files if possible – and **avoid sending contributions as PDF files**.

In particular, please send **Research Highlights and Breakthroughs** using this ***template:*** https://mipse.umich.edu/iltpc/highlight_template_v05.docx. The highlight consists of an image and up to 200 words of text; please also send your image as a separate file (the recommended image format is JPG or PNG; the minimum file width is 800 px). The topic can be anything you want - a recently published work, a new unpublished result, a proposed new area of research, company successes, anything LTP-related. Please see the *Research Highlights and Breakthroughs* for examples.

LTP Perspectives: Policy, Opportunities, Challenges

Entering the Renaissance Era of Plasma for Nanotechnology and Facilitating a Green Transition

Ph.D. student operating a plasma nanoprinting facility in the Department of Gaseous Electronics (F6) at Jozef Stefan Institute. Photo courtesy of Department F6, K. Bidovec and A. Hodalic.

Plasma technology is again entering the renaissance era by reviving microchip manufacturing technology, aiming to improve processes down to several nm, making them more speedy, controllable, 3D and more precise. The newly adopted *CHIPS Acts* in the US and EU are facilitating this plasma renaissance. Both are expected to dedicate billions of dollars/euros to next-generation technologies. The US *CHIPS and Science Act*, signed on August 9, 2022, is expected to provide $280 billion in new funding to boost domestic research and manufacturing of semiconductors in the United States alone. On the other side of the Atlantic, the *European Chips Act* is, on the other hand, expected to mobilize more than €43 billion of policy-driven investment until 2030, which will be broadly matched by long-term private investment. Both acts stream towards new-generation technologies, prototyping, manufacturing, and high-quality and radically new chips, which will all be based on sustainable green manufacturing technologies.

In microelectronics fabrication, plasma technology has played its part since the late 1960's. Initially, plasma etching was used as a crucial step in semiconductor manufacturing to define patterns and remove materials from wafers. Secondly, plasma deposition was used to deposit thin films of materials on semiconductor wafers.

Most frequently, plasma-enhanced chemical vapor deposition (PECVD) and plasma-enhanced atomic layer deposition techniques were and are still used. Plasma technology and its tools have evolved over the course of time, allowing today's nanoscale precise and controlled material removal and deposition, which are essential for creating intricate semiconductor devices.

During this period, plasma nanoscience has evolved as a separate branch of plasma technology. This multidisciplinary field aimed to explore the interaction between plasma and nanoscale materials and structures. Plasma nanoscience combined principles and knowledge of plasma physics and nanoscience to study how plasmas are used to manipulate, synthesize or modify nanomaterials and nanostructures. As a field, it covered topics ranging from nanomaterial synthesis tailoring structures at the atomic scale, surface modifications, including cleaning, functionalization and doping, to nanoscale characterization and different applications. In recent years, this field has been rapidly developing, mainly due to diverse applications in material science, electronics, energy, and health applications. Namely, the ability to manipulate and engineer materials with plasmas at the nanoscale opened numerous possibilities for technological advancements.

Today, in the background and walking in shadows, away from large funding budgets, there is a rising tide of plasma for nanotechnology. The research is done away from microelectronics and chip manufacturers, but it is step-by-step contributing to green transition. As in the past, during the early stages of semiconductor manufacturing, it plays its role as a vital tool that can assemble, synthesize or modify nanomaterials. Since plasma is sustainable and environmentally friendly processing, it is expected to become a key enabling technology for this transformation. Namely, it has the potential to provide a tool to build new nanomaterials for energy-efficient lighting, clean energy production, advanced materials for sustainable construction while reducing chemical usage. Other applications include efficient water purification, environmental remediation, waste management and recycling, green electronics and even biomedical applications or sustainable agriculture. Summarizing all these topics, no single green transformation field, as outlined in the *EU Green Deal* climate targets by 2030/2050, is left untouched.

In my opinion, the plasma community will, in forthcoming years, significantly contribute, particularly to the two key goals of the green transition: a) the transformation of the economy and b) the circular economy. The transformation will be aimed at climate neutrality by significantly reducing greenhouse gases and decarbonization, where plasmas are valuable for gas reformation in their use as a building source. In recent years, we have very efficiently used gases like methane as a carbon source for synthesizing graphene, N-graphene, or carbon nanotubes. Therefore the waste was used for material synthesis, and the residue was the clean fuel gas. Similarly, other unwanted gases, frequently present in natural liquified gas, e.g. hydrogen sulphite, were used for doping, where sulphur was recombined on the surface, and hydrogen was left as residual. These plasma-synthesized materials were further used for building advanced ultra-light electrodes for energy storage, including batteries, supercapacitors or fuel cells. We have built and proven multiple times that such systems provide superior performances compared to other materials. Since we deal with simple material systems and carbon hybrids, renewing or decomposing such devices with plasmas will be easy. This gives true meaning to the sustainability term "*cradle-to-grave principle*" *facilitated by plasmas*. Therefore, plasmas are expected to introduce and boost the circular economy and sustainable energy resources, or at least one aspect of it.

The *Green Deal* goals are led by the ambition to provide i) clean, affordable and secure energy, ii) mobilizing industry for a clean and circular economy, iii) building and renovating energy and resource-efficient way, iv) a zero pollution ambition for a toxic-free environment, v) preserving and restoring ecosystems and biodiversity, vi) going "Farm to Fork", and vii) accelerating the shift to sustainable and smart mobility. Looking at all these relevant challenges for the green transition, I see enormous potential for the plasma and nanoscience community to contribute significantly to it, directly or indirectly. I believe that *there is plenty of room at the top*!

Prof. Uros Cvelbar
Jozef Stefan Institute, Ljubljana, Slovenia
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Professor Satoshi Hamaguchi: Avid Promoter of the Synergy of Theory, Simulation, and Experiments in Plasmas

Photo courtesy of Prof. Jean-Michel Pouvesle, at Orléans, France, September 2023.

Satoshi Hamaguchi, Professor at Osaka University, has worked on a variety of topics in plasma science. He started to work on fusion plasma experiments in his undergraduate research program at the Department of Physics, University of Tokyo, and continued his graduate studies there under the supervision of Profs. Taijiro Uchida and Kenro Miyamoto. Prof. Uchida had just received a new grant to upgrade his tokamak project when Satoshi entered the Master-degree program. He was assigned to design and build a new larger (but still small) tokamak (with major/minor radii of 38 and 13 cm) and wrote his first paper on the experiments he performed with this machine. He then had an opportunity to study at Courant Institute of Mathematical Sciences, New York University, with a Fulbright scholarship, under the supervision of Prof. Harold Grad, who was a good friend of Prof. Uchida. The original plan was that he would learn fusion theory from Prof. Grad for one year and return to Tokyo to finish his Ph.D. However, according to Prof. Hamaguchi, he "fell in love with New York City" (as Courant Institute is located in the heart of Greenwich Village, Manhattan) and decided not to come back, keeping his student status in Tokyo. With Prof. Grad being in the Mathematics Department, Satoshi ended up getting two Master degrees and two Ph.D. degrees in physics and mathematics from both universities. (Sadly, Prof. Grad passed away before Satoshi finished his Ph.D. studies and Prof. Eliezer Hameiri became his thesis advisor in mathematics.)

After receiving his Ph.D., Satoshi became a postdoctoral researcher at the Institute for Fusion Studies of the University of Texas at Austin for two years, working on turbulent transport of magnetized plasmas. According to him, he was getting somewhat tired of fusion research (with its commercialization being always 50 years away) when a new opportunity arrived. He joined IBM T. J. Watson Research Center, Yorktown Heights, New York, as a research staff member (full-time employment without a fixed contract term, unlike a postdoc position) and gladly switched his field to low-temperature plasmas (LTPs). His main job was to establish technology computer-aided design (TCAD) for semiconductor manufacturing, mostly focusing on plasma processing. IBM Research was then a haven for scientists and the scientists for doing whatever they wanted. So, among many topics such as LTP simulations and etch/depo profile simulations, he worked on strongly coupled dusty plasmas, which attracted much attention from the physics community. (The dusty plasmas causing serious problems in plasma etchers are typically weakly coupled, so his company showed little interest in his work on dusty plasmas.)

In 1998, he was invited to join the faculty of Kyoto University as an Associate Professor, where he again worked on fusion theory as well as LTPs and TCAD. He also started molecular dynamics (MD) simulations of plasma-surface interactions. In 2004, he became a full professor at Osaka University and invited prominent experimentalists to establish a research group aiming to closely combine experiments with modeling and simulation. One of his main research thrusts is plasma-surface interactions for semiconductor processing, using ion beam experiments and MD/density-functional-theory (DFT) simulations.

He has also eagerly developed domestic/international collaborations with highly active groups around the world whose expertise complements his group's core competencies. Through such collaborations, he has worked on atmospheric-pressure plasmas, plasma-water interactions, and biological and environmental applications of plasmas, including plasma medicine, in addition to semiconductor processing. In all such studies, he has always emphasized close synergy among experiments, theory, and computations. His most recent passion is the

applications of data science (such as artificial intelligence and machine learning) to plasma science. He and his like-minded colleagues started the International Conference on Data Driven Plasma Science (ICDDPS) in 2018 and, most recently, he served as Co-Chair of the 4th ICDDPS held in Okinawa, Japan, in April 2023. The ICDDPS encompasses a broad spectrum of plasma science and its methodologies such as physics, chemistry, computation, and mathematics for industrial plasmas and fusion plasmas, a large part of which interestingly coincides with Prof. Hamaguchi's wide-ranging expertise and interest.

Prof. Hamaguchi's intellectual curiosity and passion for science and technology have continuously inspired us to be innovative and creative in our research. We hope he continues to be an inspirational and visionary leader for the young generation in plasma science.

Profs. Kazuhiro Karahashi, Satoru Yoshimura, and Tomoko Ito
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karahashi@ppl.eng.osaka-u.ac.jp, ysmr_aou1@ppl.eng.osaka-u.ac.jp, ito@ppl.eng.osaka-u.ac.jp

General Interest Announcements

- **Call for Proposals: *Low Temperature Plasma User Facilities* – Sandia National Laboratory and Princeton Plasma Physics Laboratory, USA**

  The *Princeton Collaborative Low Temperature Plasma Research Facility* (PCRF) and the *Sandia Plasma Research Facility* (PRF) will soon be open for their fourth round of solicitations for collaborative research proposals from the scientific community. The schedule for this year's call is:

  Call for proposals opens: October 9, 2023

  Call for proposals closes: December 15, 2023

  External Review: ~1.5 month

  Notification of Principal Investigators: by February 5, 2024

  You can learn more about both collaborative low temperature plasma facilities at their websites:

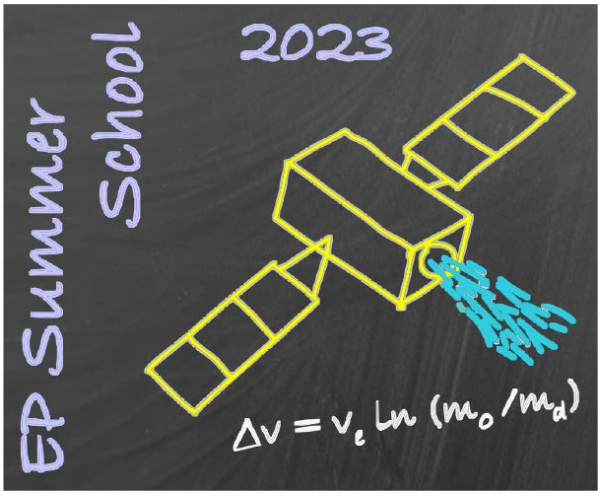
  PCRF: http://pcrf.pppl.gov

  PRF: http://www.sandia.gov/prf/

  Questions can also be sent directly to the facility directors listed below:

  Contacts:
  Dr. Yevgeny Raitses, PCRF, Princeton Plasma Physics Lab, USA, yraitses@pppl.gov
  Dr. Shane Sickafoose, PRF, Sandia National Laboratory, USA, smsicka@sandia.gov

- **First European Summer School on Electric Propulsion for Spacecraft**

  The *First European Summer School on Electric Propulsion for Spacecraft* will be held at ESA-ESTEC in Noordwijk in The Netherlands on October 10-12, 2023. The 3-day School will propose a series of lectures about EP and its application given by experts in the field. The program covers fundamental aspects, the various technologies, numerical simulations, diagnostics and space missions. It will be a unique opportunity for young PhD students, researchers and engineers to learn, to meet actors, to discuss advances and perspectives and to visit the EP laboratory of the European Space Agency. The program of the School along with speakers can be found on the School website.

To register go to the EP School website: https://indico.esa.int/event/458/

Registration will stay open until the end of September. The conference fee is 280 € for the whole school. Fee includes lectures, lunches, coffee breaks and a social event.

Organizers of the European EP Summer School 2023: Stéphane Mazouffre, Thomas Trottenberg, Kaethe Dannenmayer and Eduard Bosch Borras.

Contact:
Dr. Stéphane Mazouffre
CNRS, Orleans, France
stephane.mazouffre@cnrs-orleans.fr

Meetings and Online Seminars

- **Quantemol Plasma Chemistry Online Workshop**

The Quantemol *Plasma Chemistry Online Workshop* will take place entirely online, allowing participants from all around the world to learn about the fascinating field of plasma chemistry.

Starting on **Wednesday, October 4, 2023** at **08:00:00 GMT+0100 (British Summer Time)**, this workshop will feature a range of informative sessions and interactive discussions led by renowned experts in the field. Whether you are a seasoned researcher or simply curious about this cutting-edge field, this workshop is the perfect platform to expand your knowledge.

Don't miss out on this opportunity to explore the world of plasma chemistry from the comfort of your own home!

The agenda for the workshop and registration for the workshop are here: https://quantemol.com/events/online-workshop-4-october-2023/.

Contact:
Ms. Hannah Larsen
Quantemol, UK
hannah@quantemol.com

- **The Online Low-Temperature Plasma (OLTP) Seminar Series**

The schedule for OLTP seminars and more information on the program, including links to past seminars, can be found at the OLTP website:

https://theory.pppl.gov/news/seminars.php?scid=17&n=oltp-seminar-series

The seminars are held on Tuesdays at 10:00 am EDT or EST via Zoom and are free to access.

Co-Chairs:
Dr. Mikhail Shneider, Princeton University, USA, shneyder@princeton.edu
Prof. Dr. Vasco Guerra, University of Lisboa, Portugal, vguerra@tecnico.ulisboa.pt

- **IOPS Online Seminars**

The *International Online Plasma Seminar (IOPS)* is continuing to provide the international community with regular opportunities to hear from leading researchers in the field. The program of the IOPS (and links to past seminars) can be found at: http://www.apsgec.org/main/iops.php.

Chair:
Prof. Quan-Zhi Zhang, Dalian University of Technology, China, qzzhang@dlut.edu.cn

Community Initiatives and Special Issues

- **Special Issue on *Laser Plasma Spectroscopy Applications*, MDPI Journal *Plasma***

In recent decades, plasmas have gained prominence in different areas of physics and other related sciences, and they now have diverse applications in areas such as industrial cleaning, surface treatment and modification, medical surgery, and food analysis. Going hand-in-hand with plasmas, lasers have played a key role in plasma physics, acting either as a characterization tool or as the element that generates interaction with the plasma.

The versatility of plasmas and lasers has given rise to many interactions between them. Thus, with the aim of learning about the latest developments and the most advanced discoveries, we launch this Special Issue on *Laser Plasma Spectroscopy Applications* in the MDPI Journal *Plasma*. This issue intends to serve as a compilation of the latest developments in the field of laser plasma spectroscopy applications, covering all types of plasmas, gases, and spectroscopic applications, to serve as a reference point for further work.

Deadline for manuscript submissions: 29 February 2024.
For more details please visit the website:
https://www.mdpi.com/journal/plasma/special_issues/792AKY6M43

Contact:
Dr. Verónica González Fernández
Universidad Complutense, Spain
veronicagf@ucm.es

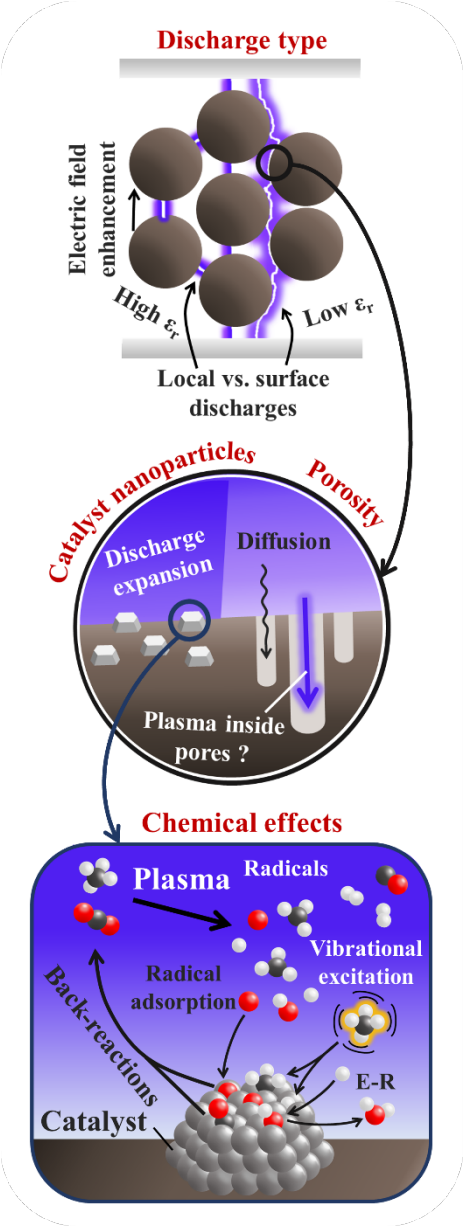
- **Topical Issue of the *Eur. Phys. J. D* - "Electron-driven Processes from Single Collisions to High-pressure Plasmas"**

A Topical Issue of the *Eur. Phys. J. D* entitled "Electron-driven processes from single collisions to high-pressure plasmas" has been recently published to honor Prof. Kurt Becker (New York University) on the occasion of his 70th birthday.

You may have access to the 20 papers of this topical issue via
https://epjd.epj.org/component/toc/?task=topic&id=1736

Contact:
Prof. Holger Kersten
Christian-Albrechts-Universität zu Kiel, Germany
kersten@physik.uni-kiel.de

Is a Catalyst Always Beneficial in Plasma Catalysis? Insights from the Many Physical and Chemical Interactions



Schematic overview of various physical and chemical interactions that can affect plasma-catalytic systems.

Plasma catalysis is promising for various gas conversion applications. However, it is also highly complex, as it encompasses various physical and chemical interactions. Consequently, its underlying mechanisms are far from understood. In our recent perspective paper, we therefore describe the important physical and chemical effects that can alter the outcome of plasma-catalytic experiments. This way, we highlight the need for standardized experimental setups, as well as careful documentation of packing properties and reaction conditions.

Moreover, based on a newly developed, coupled plasma-surface model, we illustrate that the combination of plasma and catalyst is not always beneficial. Specifically for dry reforming of CH_4, we demonstrate that plasma-produced radicals can recombine on the surface of transition metal catalysts and react back to the reactants, CO_2 and CH_4, instead of towards desired products, and we explain the detailed mechanisms. This lowers the conversion at conditions for which radicals dominate the plasma-catalyst interactions. Finally, we provide recommendations for improvement.

This study is published in: J. Energy Chem. **85**, 501-533 (2023).

Contacts:
Prof. Annemie Bogaerts and Björn Loenders
University of Antwerp, Belgium
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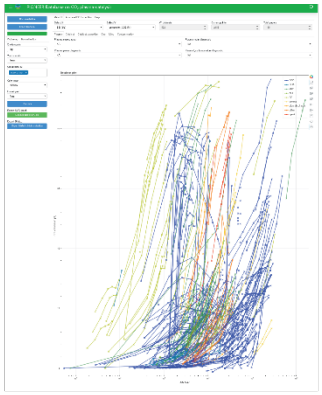
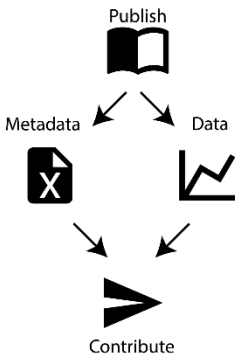
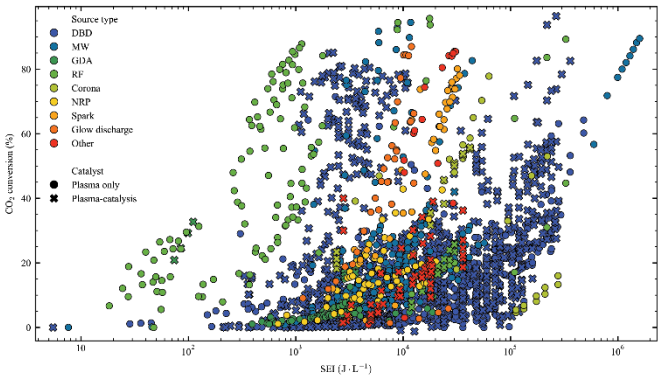
bjorn.loenders@uantwerpen.be

Source:
J. Energy Chem. **85**, 501-533 (2023).
https://doi.org/10.1016/j.jechem.2023.06.016

The CO_2 Pioneer Database for CO_2 Plasma(-catalytic) Conversion Performance Data







Working principle of the PDB: Published plasma (-catalytic) CO_2 conversion performance data is accessible together with metadata crucial for interpretation of data. An associated web interface allows for fast and comprehensive comparisons.

This study compares CO_2 conversion performance via plasma and plasma-assisted catalysis, utilizing an open-access online database with data from existing literature. The resource allows personalized analysis and invites contributions to enhance data accuracy for efficient CO_2 conversion. Stemming from the rapid expansion of plasma-catalysis in CO_2 conversion processes, the "PIONEER DataBase" was initiated through a H2020 European project. It covers diverse CO_2 conversion data associated with plasma sources and catalyst presence. Accompanying metadata specifies gas composition, plasma source, catalyst attributes, and coupling methods. The database aids visualization, identifies research gaps, and a user-friendly data extraction tool encourages contribution for enriched comparative insights and increased visibility of research data.

Contacts:
Dr. Olivier Guaitella, École Polytechnique, France
Dr. Antoine Salden, Eindhoven University of Technology, The Netherlands
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t.p.w.salden@tue.nl

Source:
J. Energy Chem. **86**, 318–342, 2023. https://doi.org/10.1016/j.jechem.2023.07.022

Database portal: https://db.co2pioneer.eu/app

New Resources

Please submit your notices for New Resources to iltpc-central@umich.edu.

Career Opportunities (for other career opportunities, see: https://mipse.umich.edu/jobs.php)

- **Post-doctoral Research Scholar – Computational Plasma Science Group, North Carolina State University, USA**

The Computational Plasma Science Group in the Nuclear Engineering Department at North Carolina State University is seeking a post-doctoral research scholar. The postdoctoral researcher will be responsible for plasma and electromagnetic modeling of high powered inductively coupled hydrogen plasmas. The computational modeling will support the development of a low temperature plasma source which produces ions for the neutral beam injectors on a DIII-D tokamak. The project will involve collaboration with experimentalists working on reduced-scale and full-scale test setups for model validation and to provide physics insights to inform key design decisions. The findings should be published in peer-reviewed journals.

The post-doctoral research scholar will work closely with **Dr. Amanda Lietz** and in collaboration with an experimental team including **Dr. Florian Laggner** and **Dr. Steven Shannon**. The ideal candidate should be capable of taking on a leadership role in planned research, execute the research in a timely manner, and deliver milestones.

Duties and responsibilities:

- Running physics simulations assessing and analyzing the resulting data.
- Assist in mentoring graduate students and undergraduate researchers.
- Disseminate research findings in publications and conference presentations.
- Collaboration with experimental and engineering partners for model validation and design support.
- Travel to scientific conferences and project meetings.

Required skills:

- Ability to clearly and concisely present scientific data both orally and in writing.
- Strong technical communication skills (written and oral).
- A strong publication record is highly desirable.

How to Apply: https://jobs.ncsu.edu/postings/188973

Contact:
Dr. Amanda M. Lietz
North Carolina State University, USA
alietz@ncsu.edu

- **Post-doctoral Research Scholar – Active Laser Spectroscopy, Ruhr University Bochum, Germany**

The Plasma Interface Physics Lab (https://piplab.rub.de/) at Ruhr University Bochum is seeking an early career scientist to work on the development of active spectroscopy of low temperature plasmas. This includes the design and setup as well as the maintenance of laser systems for detection of reactive species. The position is integrated into the Collaborative Research Centre (CRC) 1316 (https://sfb1316.rub.de/index.php/en/) "Transient atmospheric plasmas – from plasmas to liquids to solids" and is under the supervision of **Prof. Dr. Judith Golda** (PIP lab lead, https://www.physik.ruhr-uni-bochum.de/en/Professuren/jun-prof-dr-golda-judith/) and will be based at the Department of Physics and Astronomy in Bochum, Germany.

Key responsibilities:

- Investigation of non-equilibrium plasmas by use of various diagnostic techniques. In particular, collisional interactions between the constituents of the plasma and as well as the interaction with surfaces.
- Detailed analysis of the data and development of physical models for their interpretation.
- Close collaboration with the project team and colleagues within the group as well as with other colleagues within the CRC1316 and external collaboration partners is expected.

- The results will be published in international scientific journals and presented on national and international conferences and meetings.
- You are expected to participate in teaching activities and to lead research projects as well as thesis projects.

Your profile:

- PhD in plasma physics and experience with active and passive spectroscopy methods is required.
- Experience with laser diagnostics (e.g. absorption spectroscopy, (TA)LIF, E-FISH, CRDS, …) and laser maintenance (e.g. Nd:YAG, dye, …) as well as optical setup handling is desired.
- Scientific research ability demonstrated by peer-reviewed publications and presentations at international conferences.

The position is initially limited to 2 years with the possibility of extension. Please send a cover letter, CV and reprints of 3 representative publications to: Alicia Gonzalez, Ruhr University Bochum, Germany, alicia.gonzalezfontela@rub.de.

Contact:
Prof. Judith Golda
Ruhr-Universität Bochum, Germany
judith.golda@rub.de

- **Post-doctoral Position - Laser-based Plasma Diagnostics, Leibniz Institute for Plasma Science and Technology Germany**

The department of Plasma Diagnostics at the Leibniz Institute for Plasma Science and Technology (INP) in Greifswald, Germany, invites applications for a post-doc position. The application-oriented research activities in the Department of Plasma Diagnostics are centered on the development and application of advanced laser-based diagnostics for the characterisation of plasma-chemical processes and plasma-surface interactions. For open scientific questions in the field of EUV lithography, we are looking for a **post-doc candidate experienced in laser-based plasma diagnostics** to join us in an ongoing collaboration at the earliest possible date – ideally from beginning of November.

Our institute ranks among the largest and most modern institutions in the field of low-temperature plasmas worldwide. In an international working environment, we conduct socially relevant research within our core areas *Materials & Energy* and *Environment & Health*. Currently the INP employs about 200 scientists and staff at three locations (Greifswald, Rostock and Karlsburg). For further information, please visit our website at https://www.inp-greifswald.de/en/.

Full details of the advertised position can be found under the following link:
https://inp-greifswald.dvinci-easy.com/de/jobs/20392/0531-post-doc-fmd-for-laser-based-plasma-diagnostics.

Applicants should send their application (motivation letter, CV, copies of academic degrees, and letters of reference) to Mrs. Gabriele Lembke giving the keyword "0531 Post Doc Laser-based Plasma Diagnostics" - *preferably via our online application form* – **until 29 September 2023**.

Alternatively, the application can also be sent to the Human Resources Department, bewu@inp-greifswald.de.

Contact:
Dr. Norbert Lang
Leibniz Institute for Plasma Science and Technology, Germany
lang@inp-greifswald.de

- **Scientific Programmer - FORTRAN and C++, Quantemol Ltd, UK**

Quantemol Ltd is hiring a Scientific programmer FORTRAN and C++. You will work on an exciting scientific R&D project, delivering new products and services for our plasma modelling software line. We are a London-based company, and the role will be predominantly work-from-home based within the UK. Some in-person meetings and office-based coworking are to be expected (Up to 1-2 times a week). Furthermore, some national and international travel is to be expected. Specifically, you will be working on:

- Writing a 3D plasma modelling code with unstructured mesh.
- Participating in conferences and webinars relevant to your role.

Part of your work will also include customer support, test automation, and potentially conducting calculations using our software.

Knowledge, skills and experience:
Essential:
- Proven ability to code software in FORTRAN or C++ demonstrating good coding practices.
- A PhD in plasma physics.

Highly desirable:
- Experience in writing Maxwell Solver.
- Experience in working with meshes and unstructured meshes in particular.
- Knowledge of low-pressure plasma physics.

Quantemol is a scientific software and consultancy company with an international customer base and a small friendly team of experts based in the UK. We are providing plasma modelling solutions to the semiconductor industry and others. Our products are complicated but the results of your work have a real impact. We are facilitating innovation which can change the world. Join us on this journey!

Please email your CV with a cover letter to recruitment@quantemol.com.
https://quantemol.com/scientific-programmer-fortran-and-c/

Contact:
Ms. Anna Nelson
Quantemol Ltd, UK
a.nelson@quantemol.com

- **Project Manager - Quantemol Ltd, UK**

An exciting opportunity has arisen for a scientist looking to move into a business role to join Quantemol and provide efficient project management support to our research projects.

Key responsibilities:
Reporting to the CEO directly, you will be responsible for planning and executing effective and comprehensive project management services for several customer-related research projects.

- Understand the technical essence of the projects under your responsibility.
- Participate in project planning together with the research team, where you identify key deliverables and milestones in each project.
- Track progress by keeping project plan documents up to date (internal and customer versions).
- Present project progress to different audiences.
- Identify and flag any issues and delays during the project, looking for ways to mitigate the impact.
- Liaise with the researchers' team, CEO and the customer, and follow up on agreements reached during the meetings.
- Organize bi-weekly progress meetings with the team and prepare all associated reporting.
- Organize monthly customer meetings and prepare all associated reporting.
- Organize on-site visits to the customers.

To be considered for the Project Manager role, you will need the following:

- Relevant degree in Physics, a background in plasma physics is a plus.
- Some experience in project management and great attention to detail.
- Strong communication skills and capacity for self-discipline.
- Ability to present complex information clearly to diverse audiences.
- Experience working on a project with a team, preferably in research settings.
- Willingness and ability to travel (within the UK, EU, US, Korea and Japan).

Quantemol is a scientific software and consultancy company with an international customer base and a small friendly team based in the UK. We are providing plasma modelling solutions to the semiconductor industry and others. Our products are complicated, but our customers are lovely. We are encouraging innovation which can change the world. Join us on this journey!

Please email your CV with a cover letter to recruitment@quantemol.com.
https://quantemol.com/events/project-manager/

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Collaborative Opportunities

Please submit your notices for Collaborative Opportunities to iltpc-central@umich.edu.

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