# Diels-Planck Honor for Annemie Bogaerts

**KiNSIS awards its highest honor: This professor demonstrates how research in non-thermal plasmas can tackle environmental challenges – and inspires the next generation of scientists.**

This year, Annemie Bogaerts, Professor at the University of Antwerp (Belgium), delivered the Diels-Planck Lecture. With this talk, the Kiel Nano, Surface and Interface Science (KiNSIS) priority research area at Christian-Albrechts-Universität zu Kiel (CAU) honored her outstanding contributions to plasma catalysis – a field at the intersection of chemistry, physics, and materials science – bestowing the highest recognition of the interdisciplinary network.

The award ceremony took place on September 24, 2025, during the KiNSIS Symposium as part of the Plasma Technology Conference. The event also included the presentation of doctoral awards for exceptional dissertations in KiNSIS research areas.

“We warmly congratulate Professor Annemie Bogaerts on this award. She is an exemplary role model for interdisciplinary research and the promotion of early-career scientists within KiNSIS,” said Professor Maria Wächtler, spokesperson for KiNSIS, on the occasion of the Diels-Planck Lecture.

“Professor Bogaerts has long been shaping the field of non-thermal plasmas, and we are very pleased to honor her with this award,” said Jan Benedikt, Kiel physics professor and longtime collaborator of Bogaerts in his laudation. “Through her dedication and numerous publications in internationally renowned journals, she is a true inspiration for early-career researchers.”

Since 2014, KiNSIS has awarded the Diels-Planck Medal – named after Kiel Nobel laureates Max Planck and Otto Diels – to internationally leading researchers in nanoscience and surface science. The medal is crafted from a silicon disc in the clean room of the university’s nanolab and features the likenesses of Nobel laureates Max Planck and Otto Diels.

## Insights into Plasma Catalysis

Around 100 guests attended the lecture during the KiNSIS Symposium in a lecture hall at the Faculty of Engineering on CAU’s East Shore Campus. Under the title “Plasma catalysis: How to unravel the complex chemical and physical mechanisms?” Bogaerts outlined the central challenges of plasma catalysis.

Plasma catalysis uses plasmas—highly energetic gases—to accelerate chemical reactions and make them more efficient. The approach can reduce air pollutants, convert greenhouse gases such as carbon dioxide and methane, and enable more sustainable chemical production.

Bogaerts tailors catalysts to the specific conditions inside plasma reactors. She controls the active particles within the plasma—known as plasma species—that drive chemical reactions. In addition, she optimizes reactor design to ensure that plasma and catalyst interact effectively. By combining experiments with computer modeling, her research seeks to unravel the still poorly understood mechanisms of plasma catalysis and develop environmentally friendly solutions.

## International Visibility for Early-Career Researchers

The presentation of the doctoral awards was another highlight of the KiNSIS Symposium. The KiNSIS board recognized four outstanding dissertations from the fields of physics, chemistry, and engineering. The jury praised the exceptional quality, interdisciplinarity, and innovative strength of CAU's emerging researchers. KiNSIS members had nominated the awardees, who each received a certificate and €1,000 in prize money. With these awards, KiNSIS and CAU emphasize their commitment to a research environment that offers young talents international and interdisciplinary opportunities.

Dr. Christian Nehls, KiNSIS spokesperson for early-career researchers, said: "With the doctoral awards, we not only honor outstanding research but also the creativity of young scientists. KiNSIS provides them with an international, interdisciplinary environment where they can fully develop their ideas—and that is precisely what we aim to showcase."

**Physics – Dr. Timo Fuchs**

Dissertation: "In situ X-ray Scattering Studies of the Electrooxidation of Platinum Single Crystal Electrodes"

Timo Fuchs developed novel X-ray techniques to visualize the atomic-scale restructuring of platinum surfaces during electrochemical reactions. For the first time, he revealed how platinum catalysts lose performance—a central challenge in fuel cell efficiency. His work bridges physics, chemistry, and materials science, setting new standards for research on electrochemical interfaces.

**Chemistry – Dr. Jihao Wang**

Dissertation: "Support and size effect in catalytic ammonia decomposition and $CO_2$ hydrogenation"

Jihao Wang investigated catalysts for storing green hydrogen in ammonia. He demonstrated how particle size and support materials influence the activity of nickel and cobalt catalysts. His findings provide strategies for designing more efficient processes and advance the development of a hydrogen economy.

**Engineering – Dr. Krathika Bhat**

Dissertation: “In vitro effects of degradable Magnesium-Lithium thin films on cells of the nervous system”

Krathika Bhat characterized magnesium-lithium alloys that degrade in the body and release lithium locally. Through biological models, she showed that these materials can reduce inflammation and promote certain neuroprotective factors. Her work paves the way for bioresorbable implants aimed at treating neurological disorders more safely and effectively.

**Engineering – Dr. Ole Gronenberg**

Dissertation: “Exploring Complementary Approaches in Electron Microscopy for Neuromorphic Devices”

Ole Gronenberg applied a combination of electron microscopy methods to study neuromorphic hardware. He revealed how nanoscale processes, such as “spiking” in nanoparticle networks, alter conductive pathways. His research connects materials science and electrical engineering and lays the groundwork for a new generation of energy-efficient computing devices.

## Further information

- Past Diels Planck Lectures
- More about Annemie Bogaerts
- Abstract Diels Planck Lecture 2025
- Plasma Technology conference 2025
- Kiel nano lab

## Press contacts

Christina Anders
Science Communication
Priority research area KiNSIS
canders@uv.uni-kiel.de
+49 431-880-4855

## About Kiel Univerisity's Priority research area KiNSIS:

The nanoworld is governed by different laws than the macroscopic world, by quantum physics. Understanding structures and processes in these dimensions and implementing the findings in an application-oriented manner is the goal of the priority

research area KiNSIS (Kiel Nano, Surface and Interface Science) at Kiel University. Intensive interdisciplinary cooperation between physics, chemistry, engineering and life sciences could lead to the development of novel sensors and materials, quantum computers, advanced medical therapies and much more. www.kinsis.uni-kiel.de/en