# NINa-News

North European Initiative Nanotechnology e.V.

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www.nina-sh.de


## Dear Reader

Innovations are of central importance for our society and economic development. Hardly any other field represents this as impressively as nanotechnology. This exciting science, which deals with structures and materials in the nanometer range, inspires me personally. The potential is enormous and the applications are diverse - from medicine and electronics to environmental technology.

The diverse applications of nanotechnology can both improve everyday life and provide important impetus for the economy. We see great opportunities here in Schleswig-Holstein, as our region is characterized by a high level of scientific expertise in the field of nanotechnology. However, even the greatest expertise is of no use if the scientific findings cannot be translated into actual products! It is therefore important that technology transfer is supported by the strong network "North European Initiative Nanotechnology" (NINa). NINa promotes co-operation between science and industry in order to bring research findings into application more quickly and effectively.

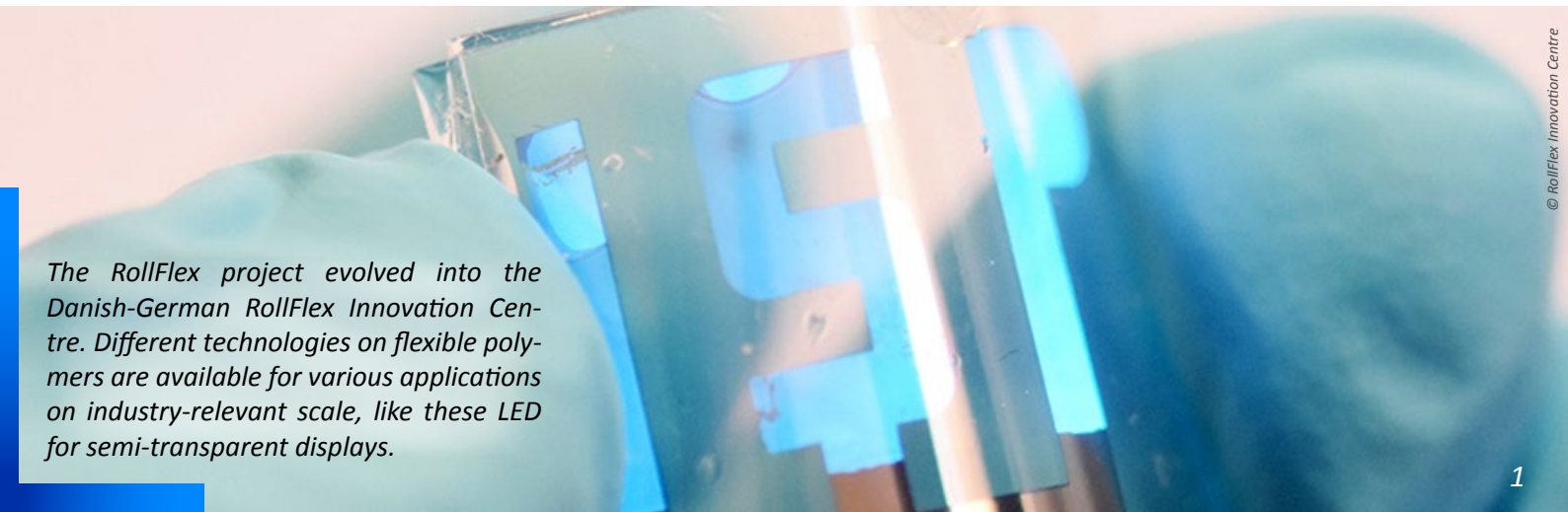
This is why the Business Development and Technology Transfer Corporation of Schleswig-Holstein (WTSH) is heavily involved in NINa. Schleswig-Holstein companies can benefit from the cooperation with NINa, for example by initiating joint national or international projects (e.g. "Rollflex" - activation of films for photovoltaics or microelectronics, or "SuSiBaby" - development of silicon-based batteries).

Another point is the transfer of knowledge by means of highly qualified university graduates. This transfer will be strengthened by the newly founded Science and Technology Academy in order to bind international students to companies at an early stage. Close cooperation is important for companies in the state in order to remain competitive, open up new markets and create future-proof jobs.

Let's shape the future together in an innovative way!

*Dr. Matthias Böttcher*

*Dr. Matthias Böttcher*
*Innovation consultant at the WTSH*
*and Extended Board member of NINa*



*The RollFlex project evolved into the Danish-German RollFlex Innovation Centre. Different technologies on flexible polymers are available for various applications on industry-relevant scale, like these LED for semi-transparent displays.*

# NINa on our own behalf:
# North European Initiative Nanotechnology e.V.

## Dear members and network partners,

*Prof. Dr. Franz Faupel, founder and 1st Chairman NINa*

*Dr. Christian Ohrt, Nanotechnology Office*

The year 2023 presented our association with major challenges. The network was funded by the Ministry of Economic Affairs and the European Union until the beginning of 2023, but this funding ended and the future of our activities seemed uncertain.

It is therefore all the more gratifying that, with the support of the Ministry of Education, we have succeeded in permanently establishing the Nanotechnology Office at Kiel University (CAU) in the form of a staff position and a working budget. Since 1 January 2024, the position has been held by the Managing Director of NINa Dr. Christian Ohrt. Thanks to this new structure, the activities of the association can be continued in the future in close coordination with the Executive Board.

With this new perspective, now is the right time to continue the already pronounced internationalization of our network, particularly with regard to the countries bordering the Baltic Sea. For our international network partners, this objective should also be reflected in the name of the association. At the last general meeting, it was therefore decided that the association will operate under a new name in future: **the "North German Initiative Nanotechnology Schleswig-Holstein" will become the "North European Initiative Nanotechnology" with immediate effect.** With this name, the abbreviation NINa and the graphic logo will be retained.

The re-organization is also reflected in the Executive Board. Our long-standing member of the Board of Trustees, Prof. Dr. Horst-Günter Rubahn from the University of Southern Denmark, has taken over the position of Second Chairman from Dr. Rainer Döhl-Oelze, who actively helped shaping our association as Second Chairman for many years. In addition, Dr. Matthias Böttcher, representing the WTSH, will strengthen the Extended Board and take over the role from Joachim Bergmann, who has also done valuable work for the association for many years. We owe a great debt of gratitude to him and Dr. Döhl-Oelze, who will continue to advise us on the Board of Trustees.

As part of our endeavors to promote cooperation between science and industry, we would also like to draw attention to the introduction of the Science and Technology Academy (STA) at the CAU. This initiative, launched by our Executive Board member Prof. Rainer Adelung, offers financial support and practical experience through partnerships with companies to highly qualified Master's and doctoral students in the fields of materials science and electrical engineering. The STA is an important step towards strengthening technology transfer and addressing the shortage of skilled labor in the region. NINa acts as a co-operation partner of the CAU in the STA project and supports networking between the university and industry. The project, which was launched on 19 January 2024, is funded by the state of Schleswig-Holstein with around 320,000 euros.

To summarize, we say: the course is set for the future!

*The newly founded Science and Technology Academy offers companies access to highly qualified university graduates.*

Franz Faupel

Prof. Dr. Franz Faupel
1st Chairman NINa

Christian Ohrt

Dr. Christian Ohrt
MD NINa

# Flexible functional materials for innovative energy and medical solutions

**Professor Tayebeh Ameri has been a full Heisenberg professor since September 2023, holding the Chair for Composite Materials in the Faculty of Engineering at Kiel University. She succeeds Professor Franz Faupel in this position. Ameri also serves as an honorary lecturer at the University of Edinburgh. Additionally, Ameri is the co-founder and scientific mentor of the start-up SERINO, established in 2021, which received an EXIST grant in 2023. The company focuses on developing IR-detectors for food and medical applications.**

*Microscope image of a specifically tailored material surface for highly efficient solar cells.*



Reflecting on her journey, Ameri shares, “During my PhD, I was more on the industrial side, which didn‘t offer many opportunities for publishing scientific results as well as teaching contribution. However, it became clear to me that I wanted to pursue an academic career because I enjoy both science and teaching. I value the contact with the next generation and care deeply about their education.“

*Prof. Dr. Tayebeh Ameri holds the Chair for Composite Materials at Kiel University.*

After completing her PhD, Ameri worked under renowned researchers, a period she describes as very rewarding. However, she realized that she wanted to establish her own research group to conduct independent research. After two and a half years as an associate professor in the UK, she returned to Germany. “I am very thankful for the offer from Kiel University and the Heisenberg professorship funded by the DFG,“ she says.

Ameri‘s research focuses on novel materials for energy and medical applications, including the theoretical design and experimental realization of organic, perovskite, and hybrid materials. These materials are integrated into systems like solar cells and detectors. A key feature of her work is mechanical flexibility, enabling applications in wearables, particularly in medical technology.

This work is incorporated into the existing CRC1261, which recently received a third funding phase. “Becoming part of this CRC is a great example of the collaborative environment at Kiel University and the supportiveness of colleagues integrating my work into the local scientific community,“ she notes.

As the successor to Professor Franz Faupel, Ameri aims to combine his extensive experience in vapor phase deposition processes with her solution-based approaches. „In this way, the succession is a smooth and fruitful process, utilizing Professor Faupel’s scientific legacy,“ she explains.

Moving from Edinburgh to Kiel even brought an unexpected improvement, Professor Ameri laughs - “better weather.”

# DESY becomes a member of NINa

**The Deutsches Elektronen-Synchrotron DESY continues to contribute its scientific expertise in nanoscience to the North European Initiative Nanotechnology - now as a member after joining NINa. With its brilliant light sources and highly complex high-tech facilities, DESY is one of the world's leading particle accelerator centers.**

DESY opens the gateway to the nanoworld thanks to its X-ray sources FLASH, PETRA III and the European XFEL. They are the ideal supermicroscopes for observing and understanding structures and processes in the nanoworld.

The research center conducts cutting-edge research and develops key technologies on a state-of-the-art campus with partners such as the University of Hamburg, the Helmholtz Centre HEREON, the Max Planck Society and the European Molecular Biology Laboratory (EMBL) as well as interdisciplinary centers such as the Centre for Structural Systems of Biology (CSSB), the Centre for Free-Electron Laser Science (CFEL).

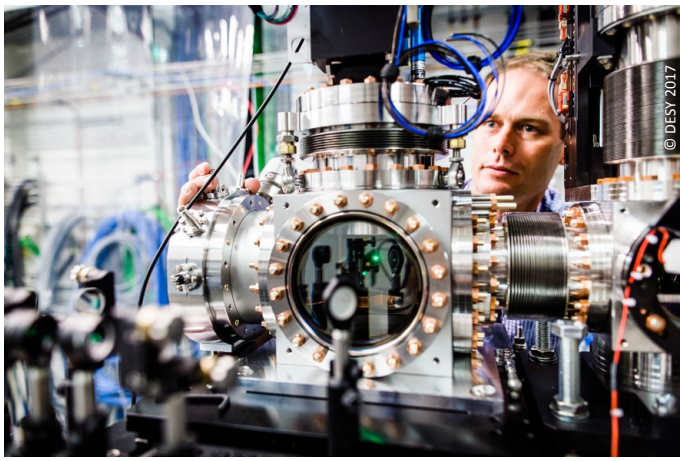
Since 2022, the new Centre for X-ray and Nanoscience CXNS has been combining expertise and high-tech to research valuable materials and catalysis processes. CXNS houses the DESY NanoLab as well as laboratories and installations of renowned research institutions.

The CXNS offers ideal conditions for nano and materials research with photons and complementary methods. High-tech laboratories with mutually complementary, networked analysis and research methods are concentrated in one place and directly connected to the DESY large-scale research facilities.

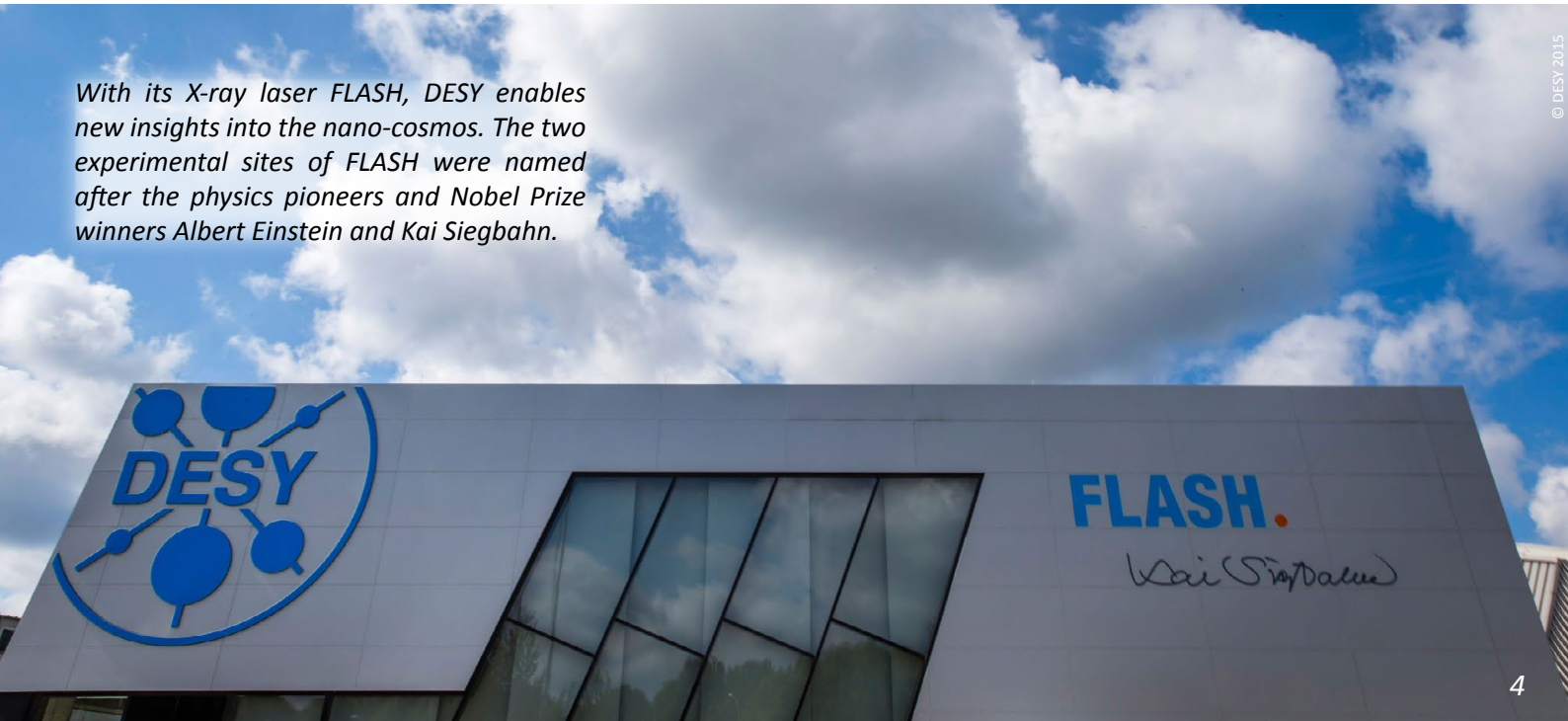
Researchers can produce, prepare and analyze their nanosamples in the DESY NanoLab before X-raying them with DESY's X-ray light sources - a service that is not available in this form at any other X-ray light source.

Both research and industrial collaborations are possible at and with DESY. "By joining NINa, we are delighted to come into contact with other exciting innovation players in the field of nanotechnology - from research and industry," says Helmut Dosch, Chairman of the DESY Directorate. "Nanotechnology and new materials are highly relevant as key technologies for DESY and offer enormous solution potential for major societal challenges."

More information on the Photon Science research field are given on DESY's website.




*Biomolecules like proteins can be investigated with the XFEL to better understand their structure and function.*




*With its X-ray laser FLASH, DESY enables new insights into the nano-cosmos. The two experimental sites of FLASH were named after the physics pioneers and Nobel Prize winners Albert Einstein and Kai Siegbahn.*

# Sustainable functional coatings instead of Forever Chemicals

**The so-called iCVD technology has been continuously refined for years by the conformally team at the Chair for Multicomponent Materials at Kiel University. The start-up conformally now received 700,000 euros EXIST funding until 2025 from the Federal Ministry of Economics and Climate Protection (BMWK). They are being supported at Kiel University by the Center for Entrepreneurship (ZfE).**

© Julia Piehl

*Special iCVD-coatings make surfaces hydrophobic, among other possible functional properties.*

From cookware and displays to packaging materials - the so-called „Forever Chemicals“ PFAS (per- and polyfluoroalkyl substances) are used in countless applications due to their repellent effect against water, grease and dirt. However, their extreme chemical and thermal resistance is both a solution and a problem - PFAS are not or hardly degradable and are considered harmful to the environment and health. Their use in industry is therefore to be restricted throughout the EU from 2025.

© Alexandrina Turcanu

*The conformally team (from left): Torge Hartig, Joschka Paulsen, Tim Pogoda, Julia Piehl and Dr. Stefan Schröder.*

With its solvent-free iCVD (initiated chemical vapour deposition) technology, the start-up conformally can coat almost all products and components with thin polymer films and equip them with various functions. The company name is derived from the high degree of conformity, i.e. uniformity, of the coatings. The process enables the production of ultra-thin layers (10 nm - 10 µm) with a variety of properties for a wide range of applications.

The coatings are used in particular in sensor technology (insulation, gas permeability, hydrophobization), medical technology (non-stick and anti-viral properties, biocompatibility) and microelectronics (barrier layers, ultra-precise electrets) and offer a sustainable alternative to PFAS. With its expertise and process capabilities, conformally offers customers joint product development (contact: contact@conformally.eu). In the future, the range of services will include both contract coating and the sale of iCVD coating systems.

# Seventh NIBS-Conference 2024 in Tartu

The international conference series Nanotechnology and Innovation in the Baltic Sea Region - NIBS will enter its seventh edition from October 6 to 9, 2024. The conference will take place at the VSpa Conference Center in Tartu, Estonia. As in 2022, NIBS will be co-located with the Functional Materials and Nanotechnologies (FM&NT) conference. Further information and registration can be found on the joint NIBS 2024 and FM&NT conference website.

NIBS conference 2024
Nanotechnology | Innovation | Baltic Sea Region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