NINa-News

North German Initiative Nanotechnology SH

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www.nina-sh.de

Dear Reader

A closed border divides, an open border broadens horizons and possibilities. Research and development in the borderland between Germany and Denmark means using the open border to gain access to the best from both countries as far as northern Scandinavia and southern Central Europe. This also and especially applies to nanotechnology, which has proven itself as a cross-sectional technology through its high flexibility and applicability for solving global challenges.

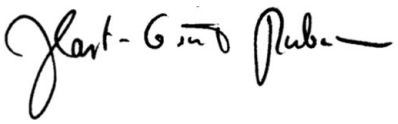
Nanotechnology as a driver of disruptive solutions combines basic research with industrial application, applied research with global production - in Denmark as well as in Germany. This was recognized in Denmark on both the university and industrial side in the mid-2000s - it is therefore not surprising to find nanotechnology cutting-edge research where industry is concentrated: Aalborg, Aarhus, Sønderborg and Copenhagen.

In Sønderborg, the nanotechnology center NanoSYD has existed since 2007, from which the center C:MAC (centre for materials analysis and characterization) was spun off in 2021 and CAPE (centre for advanced photovoltaics and thin film energy devices) in 2022. NanoSYD is a part of the Mads Clausen Institute (MCI), located on Denmark's most international campus in intensive interaction with local industry. The international environment together with a unique research infrastructure in Southern Denmark, including a clean room, has led to a large number of international network projects in research and innovation over the past 15 years - with a special focus on the German-Danish region, which receives special support, e.g. through Interreg programs.

For more than ten years, NINa has been an indispensable partner for NanoSYD and MCI with regard to the nanotechnology-oriented linking of university and industry, but also for further networking in the Baltic Sea region - just mention the joint NIBS conference series. For us it is therefore important that NINa is continued, preferably with an extension to ‚new materials'. Materials science and nanotechnology are recognized as key enabling technologies in Denmark, both in academia and industry, to counter the crises of our time through targeted ‚innomissions'.

Prof. Dr. Horst-Günter Rubahn

We look forward to further intensive collaboration,



Horst-Günter Rubahn
Prof., Director, Mads Clausen Institute, Syddansk Universitet

At the Mads Clausen Institute of the University of Southern Denmark in Sønderborg research is conducted in the fields of nanotechnology, photonics and materials science following the credo „innovation across borders".

Pushing the limits of industrial nanomanufacturing with Nanoimprint Lithography

Nanoimprint Lithography (NIL) is a manufacturing process for replicating patterns and features at the nanometer scale. Stensborg A/S, a high-tech Danish company with global outreach, was established with the introduction of NIL and has been on the market for over two decades. Their Roll-to-Plate and Roll-to-Roll nanoimprinting methods have various applications in many sectors such as Photonics, Medical devices, Solar energy, and Augmented reality, to name a few.

Nanoimprint Lithography has been improving the world since 1995, as it fulfilled the technological demand of the semiconductor and flexible electronics industries by supplying low-cost yet high throughput ability to replicate both micro-and nanoscale structures. Compared to traditional photolithography, ultraviolet (UV) nanoimprint lithography enables users to multiply volume output with lower energy consumption and decreased production times with multiple steps becoming redundant.

Founded by Jan Stensborg, an industry expert with many years of experience within the nanoimprinting field, Stensborg A/S is the manufacturer of roller-based UV-nanoimprint lithography machines, light-curing resins, and nanoimprinting templates. With customers and partners across the world, Stensborg managed to build a business based on trust and strong expertise which are key assets in industrial manufacturing.

The nanoimprint lithography machines range from small prototyping tools to high-volume manufacturing Roll-to-Roll machines. Roller-based nanoimprinting provides users with higher production capacity than conventional manufacturing methods like injection moulding.

With more than 20 years of expertise and multiple patents, Stensborg is now expanding the business into new applications of the UV-NIL process, exemplified by the unique Desktop Roll-to-Plate NanoImprinter. This compact prototyping tool provides the users with the ability to quickly explore new UV-curing resins and grants them extensive control over the nanoimprinting process. The roller-based nanoimprinter facilitates users with an ideal environment for fast prototyping, fabrication of micro- and nano-structures, small-scale nanoimprinting and testing for NIL process development. The Desktop R2P NanoImprinter's uniqueness is further recognised by two granted patents on the tool's apparatus and the optical engine.

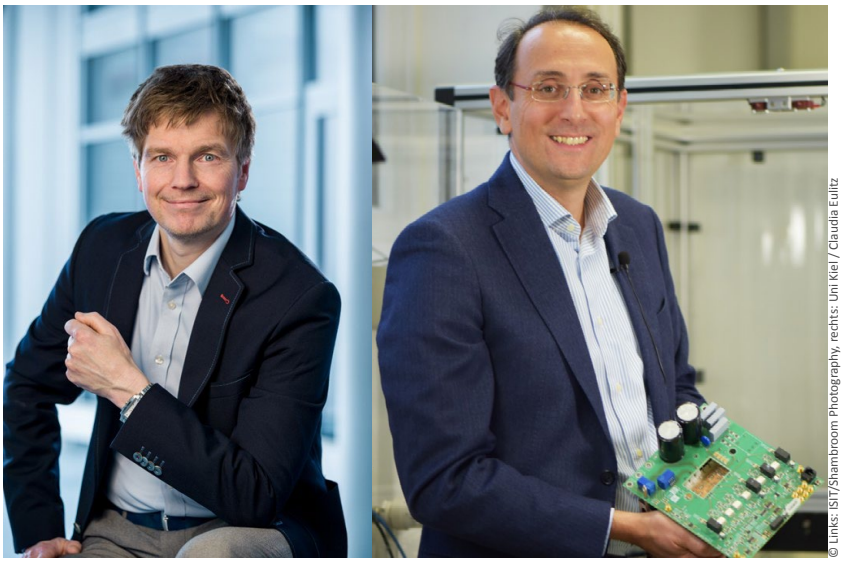
Learn more about Stensborg on www.stensborg.com and stay up to date about their work through LinkedIn: @stensborg; Facebook: @holoprinters; and Twitter: @Stensborg.

Stensborg A/S operates its own clean room facilities for the realization of development projects.

The desktop NanoImprinter is an innovation for rapid prototyping and for nanoimprinting in small quantities.

Innovation momentum from Fraunhofer ISIT in Itzehoe

After the change of the institute's management, Fraunhofer ISIT continues to grow and provides important impulses for the local research landscape with cutting-edge technology and cooperation projects.



© Links: ISIT/Shambroom Photography, rechts: Uni Kiel / Claudia Eulitz

Left: Professor Dr. Holger Kapels is acting director at Fraunhofer ISIT. Right: Professor Dr. Marco Liserre heads the new group Electronic Power Systems.

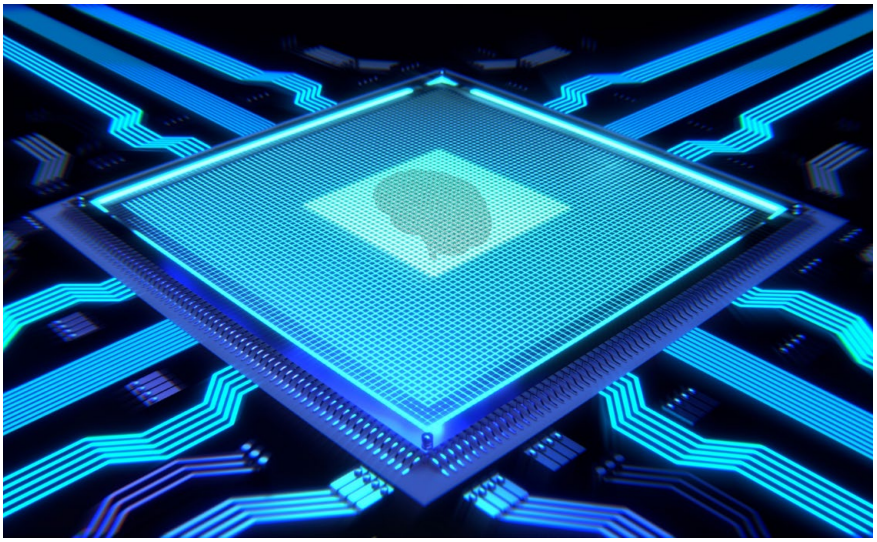
Following the transfer of Professor Dr. Axel Müller-Groeling to the Executive Board of the Fraunhofer Society, Professor Dr. Holger Kapels will provisionally take over the management of Fraunhofer ISIT. „I will actively continue the positive development of ISIT over the past five years and the growth path we have embarked on," says Kapels.

He has already been working at Fraunhofer ISIT since 2014 as head of the business unit Power Electronics and was deputy institute director. In addition, he previously held a leading position in the development department of a renowned industrial company. Alongside his activities at Fraunhofer ISIT, Holger Kapels is also a professor for electrical power devices at Kiel University (CAU).

In order to expand the cooperation between ISIT and CAU, a joint working group Electronic Power Systems was founded. The start-up phase of the research group, which is located at the Faculty of Engineering of the CAU, is funded with five million euros. The funds are provided in equal parts from the Fraunhofer Society and from the state of Schleswig-Holstein. The group is headed by Professor Marco Liserre and will advance energy transition research initially in the three thematic areas „Future-oriented power grids", „Intelligent storage technologies for electromobility" and „Semiconductors - reliable and long-lasting". In future the working group is going to develop into a sub-institute of the Fraunhofer-Gesellschaft at the location of the Faculty of Engineering. „This cooperation further strengthens the Fraunhofer activities in the state and thus increases the performance of Schleswig-Holstein as a science location in the field of application-oriented research," emphasizes Science Minister Karin Prien.

Kapels intends to make greater use of ISIT's competencies to generate decisive impetus on major future topics such as quantum computing and neuromorphic data processing. For example, five institutes of the Fraunhofer Society are working under the leadership of ISIT on particularly energy-efficient and intelligent sensors for the next generation of autonomous systems within the NeurOSmart project. This Fraunhofer Lighthouse project has a duration of four years and a financial volume of eight million euros. The human brain serves as a model for the so-called neuromorphic electronics to be developed, because despite its enormous computing power, it is very energy-efficient when making decisions.

With advanced battery research and new microtechnologies that push the boundaries of what is possible, ISIT in Schleswig-Holstein remains a world-class driver of innovation.



A novel kind of transistor is at the core of fast and efficient data processing with which chip are to be made smarter in the project NeurOSmart.

Science and Technology Academy: Sustainable recruitment of skilled workers for regional companies

The Science and Technology Academy will be founded at the Faculty of Engineering of Kiel University in the winter semester 2023/2024. Its aim is to link north German companies and university technology transfer more closely.

The Science and Technology Academy (STA) was set up to counter the growing shortage of skilled workers and to meet the steadily increasing demand for technology transfer. The latter is a result of the high pressure to innovate that companies are facing due to ever shorter innovation cycles and the current crises.

Within the framework of the STA, highly qualified students in the master's phase of international degree programs are given the perspective of financing their studies while at the same time maintaining contact with participating companies. Based on the concept of a dual study program, students receive funding, which minimally includes basic support, through sponsorships from the companies. In return, the students commit to working for the companies during the lecture-free periods. This concept is intended to tie skilled workers to regional companies at an early stage.

© Uni Kiel / Sandra Opriseck

Furthermore, the STA will also provide support during the doctoral phase and enable partnerships that go well beyond the previous, so-called industrial doctorate. Companies increase their attractiveness if they can give their employees the opportunity to do a doctorate, and conversely they benefit from the trained workforce. Particularly during the doctoral phase, the exchange with university researchers should be intensified. The starting point for these efforts is the international master's degree program in materials science. Other courses of study are to follow successively.

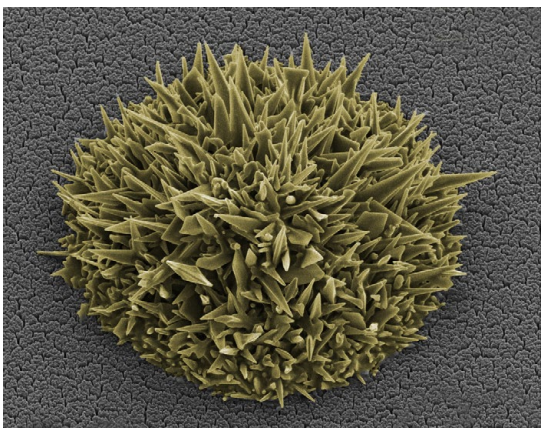
Professor Rainer Adelung initiated the founding of the Science and Technology Academy at the Technical Faculty of Kiel University where he leads the Chair for Functional Nanomaterials.

The initiator and idea provider for the STA is Professor Dr. Rainer Adelung from the Functional Nanomaterials working group at Kiel University's Faculty of Engineering. The North German Initiative Nanotechnology supports the establishment of the academy with its extensive contacts to local companies.

If you and your company are interested in becoming a sponsor of the Science and Technology Academy, please contact Dr. Christian Ohrt from NINa SH at ohrt@nina-sh.de.

Nanoworkshop 2023 „International Workshop on Functional Nanocomposites“

From September 12-15, 2023, the 11th Nanoworkshop focusing on the latest developments in the field of functional nanocomposites will take place in the picturesque Plön Castle near Kiel, Germany. There, the workshop series started 20 years ago and in between took place at locations all over the world. The event gathers an international and interdisciplinary group of participants around experimental and theoretical topics in materials science and industrial applications. For more information, visit nanoworkshop2023.nina-sh.de.



Fifth NIBS Conference: Nanotechnology and Innovation in Baltic Sea Region 2023

The international conference series Nanotechnology and Innovation in the Baltic Sea Region - NIBS will enter its fifth edition from July 3-5, 2023. The conference will take place in Sønderborg at the University of Southern Denmark.

NIBS 2023 provides an ideal opportunity to increase your visibility as a scientist, company or other stakeholder in the field of nanotechnology within the Baltic Sea region. You can benefit from an active regional nanotechnology network and get a perfect stage to initiate new projects or start-ups and find new partners and customers. The deadline for abstract submission is June 1 and registration will open in early May.

The conference is organized by the Mads Clausen Institute at the University of Southern Denmark, the North German Initiative Nanotechnology Schleswig-Holstein network, led by Kiel University, Germany, as well as Kaunas University of Technology and Lithuanian Materials Research Society.

For more information about the program, registration and other details, please visit the NIBS 2023 conference website: https://event.sdu.dk/nibs23.

Dialogue Nanotechnology announces new events

The Dialogue Nanotechnology event series provides an open forum for experts from research, government agencies and industry to discuss current issues and current developments in nanotechnology. With contributions from applied science, federal agencies and authorities as well as practical examples from industry, different facets of nanotechnology are highlighted in virtual workshops. The series is organized jointly by NINa SH e.V., Cluster Nanotechnologie / Nanoinitiative Bayern GmbH and Nano in Germany e.V.

Sustainable and circular product development
April 27, 2023 | 2-5 pm | Zoom

For consumer acceptance and regulatory compliance, new products must not only offer innovative solutions, but also be safe and sustainable. In this regard, it is beneficial for innovators to consider the safety and sustainability aspects of new products from the beginning of the development process. Often, considerations are not made until too late, when a lot of money has already gone into development. It is also important to keep the entire life cycle of the products in mind. There are major challenges, especially when it comes to recycling nanoproducts. Among other things, the event will address the points of recycling, sustainability and product safety.

Upscaling of nanotechnologies
June 29, 2023 |2-5 pm | Zoom

Moving from the development lab to production is accompanied by many challenges and, in particular, upscaling new materials and products from lab scale also comes with certain risks. This event will address the issues and challenges of upscaling nanomaterials and nanotechnologies.

For more information about the upcoming events and for registration, please visit: nanoinitiative-bayern.de/dialog-nanotechnologie.

If you have any suggestions for topics to focus on at the upcoming events, you are welcome to send your suggestions to ohrt@nina-sh.de.

Imprint

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