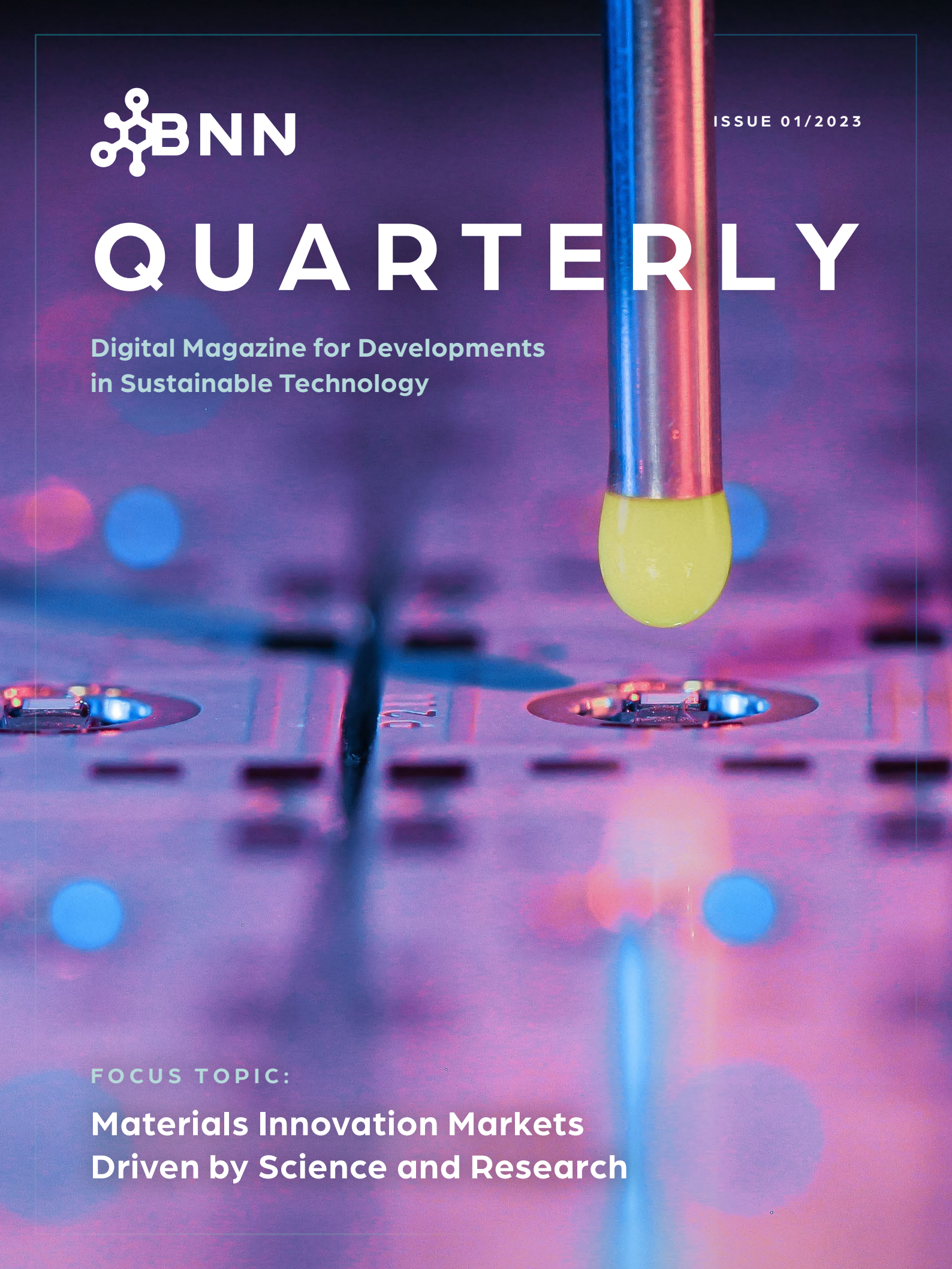

BNN

ISSUE 01/2023

QUARTERLY

Digital Magazine for Developments in Sustainable Technology

FOCUS TOPIC:

Materials Innovation Markets Driven by Science and Research

INNOVATION IS THE KEY.
SUSTAINABILITY LEADS THE WAY.

Cover: Researchers at the JOANNEUM RESEARCH Institute MATERIALS have developed a novel method for stabilizing PDMS elastomers.

WWW.BNN.AT

Editorial

MATERIALS INNOVATION MARKETS AND BEYOND

In early March, we had the pleasure of welcoming so many of you at our BioNanoNet General Assembly and BNN Networking Event in Graz. For more than 15 years, this event has served as a meeting point to exchange knowledge and make connections across our many member companies and institutions. What a privilege it was to host our members in our hometown, in person, while listening to a variety of presentations.

Many of our members are active in research and development in so-called AMI2030 materials innovation markets, which was the focus of our event and is now the focus topic of this issue of the BNN QUARTERLY. Our associations' members and colleagues from our technology platforms have already contributed to the preparation of the AMI2030 Roadmap in several working groups. These strategic developments will have a significant impact on a wide range of high-tech markets. Thus, we will be paying close attention to the AMI2030 materials innovation markets and encourage our members to further engage in this initiative.

One highlight in this issue is our interview with Lars Montelius, co-chair of AMI2030, recorded live in our offices at Kaiser-Josef-Platz in Graz. Read an excerpt from the interview here and watch the full recording.

Speaking of interviews, we have been wanting to get to know our members as the people behind the organizations – that's why we are pleased to introduce our new Member Interview series. Take a glimpse at a day in the life and travel along the career paths of two new members.

We look forward to continuing to explore these fields and to bring you the latest updates and insights in future issues of our magazine.

Andreas Falk, CEO

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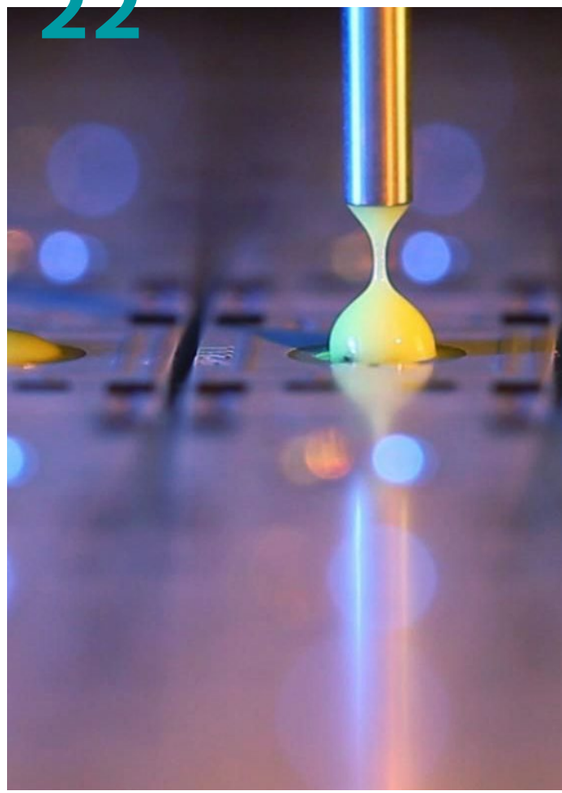


BNN News

NEW BIONANONET MEMBER

We are happy to welcome our new BioNanoNet member:

Advanced Manufacturing Laboratory (AML)

Extraordinary Member, Spain

The activity of the group focuses on the micro- and nanostructuring of polymers and liquid crystals in the search of novel functional polymeric systems of interest in different application fields such as Biomedicine, Photonics and Soft Robotics.

View all members

We're hiring!

Advanced Materials & Sustainability Expert

Send your application to office@bnn.at

READ MORE

4th BioNanoNet Member Welcome Webinar

On 26 January 2023 we had the pleasure to host our fourth BioNanoNet Member Welcome Webinar. Four organizations that recently joined the BioNanoNet Association presented their organizations and expertise:

- Virtual Vehicle Research GmbH presented by Aldo Ofenheimer
- Green Tech Cluster Styria GmbH presented by Nicole Velimirovic
- Microfluidics Innovation Hub (MIH) presented by Ronald Tingl
- Applied Nanoparticles SL presented by Marti Busquets Fité

Our Welcome Webinars give new members the opportunity to provide insights into their organizations, their latest research, developments, and collaborations within a particular field. Webinars like these are a great opportunity for professionals and researchers to stay up-to-date on the latest developments in their field and to connect with others who share similar interests. They provide a platform for knowledge sharing and collaboration, which can lead to new ideas and innovations.

You can download all presentations here. We also recorded the presentations of our new members. Enjoy watching the video!

Webinar brings expert on sex and gender in biomedical research to BNN community

On 7 February 2023, BNN held the webinar "Sex and gender in biomedical research: concepts and examples" featuring Sabine Oertelt-Prigione, moderated by Caitlin Ahern.

Prof. Oertelt-Prigione is a physician specialized in internal medicine, sex- and gender-sensitive medicine and public health with a professional focus on the development of user-centred innovative prevention methods for socially relevant issues (from gender inequality in health to refugee health to prevention of interpersonal violence and sexual harassment). She was a member of the European Commission Expert Group on "Gendered Innovations" and currently chairs the Expert Group on "Gender and COVID-19".

Nearly 50 people attended this highly interesting webinar, in which Prof. Oertelt-Prigione broke down the many layers of sex and gender and their impact on biomedical research: from disaggregating drug trial results between men and women to the influence of researchers' sex/gender on experimental outcomes. She guided researchers through the important questions to ask when setting up biomedical research: What do you have to consider, how to start, what should be measured during the experiments and what should be reported in the resulting publication? With several concrete examples from a variety of fields, this webinar was an illuminating while practical source of information for all researchers working with humans and animals.

You can download the presentation and watch the recording here.

EC Stakeholder Workshop on Safe–and–Sustainable–by–Design Case Studies

On 9-10 February, the European Commission organized a stakeholder workshop in Brussels presenting the performed case studies on Safe-and-Sustainable-by-Design (SSbD). These case studies, which kicked off in Autumn 2022, aimed to test the JRC SSbD framework for the first time in different industrial sectors, to assess its applicability and identify how to further improve it.

Since the release of the EC recommendation on SSbD in December 2022, which refers to the JRC SSbD framework in its annex, a two-year testing phase until the end of 2024 was launched where the framework will be tested and refined. This workshop was the third of its kind organized by the EC on SSbD, and more than 600 participants joined on-site and online. The aim of the workshop was to present first results on implementing the JRC framework on SSbD in industrial cases. In total, four different case studies were presented – the case study on plasticizers used in food contact materials was led and presented by JRC, while three more case studies (two on flame retardant materials and one on enzymes) were led and presented by industry representatives.

Some lessons learned from the case studies are that SSbD is a very broad topic that currently requires a lot of effort, resources and expert know-how to be implemented seriously; and that in all four steps of the framework (hazard assessment, safety assessment of production and processes, safety assessment of the final application, and environmental sustainability assessment), available and reliable data along the supply chain is the limiting factor with respect to the quality and certainty of the assessment outcomes. Nevertheless, the JRC framework builds a starting point that should help all actors in R&D&I to become safer and more sustainable from early innovation onward. From BNN, Susanne Resch participated in the workshop in Brussels. If you are interested in any further information on this workshop or if you have any questions related to SSbD, feel free to get in touch: susanne.resch@bnn.at.

The SSbD framework is currently a textbook that now needs to be translated into a toolbox.

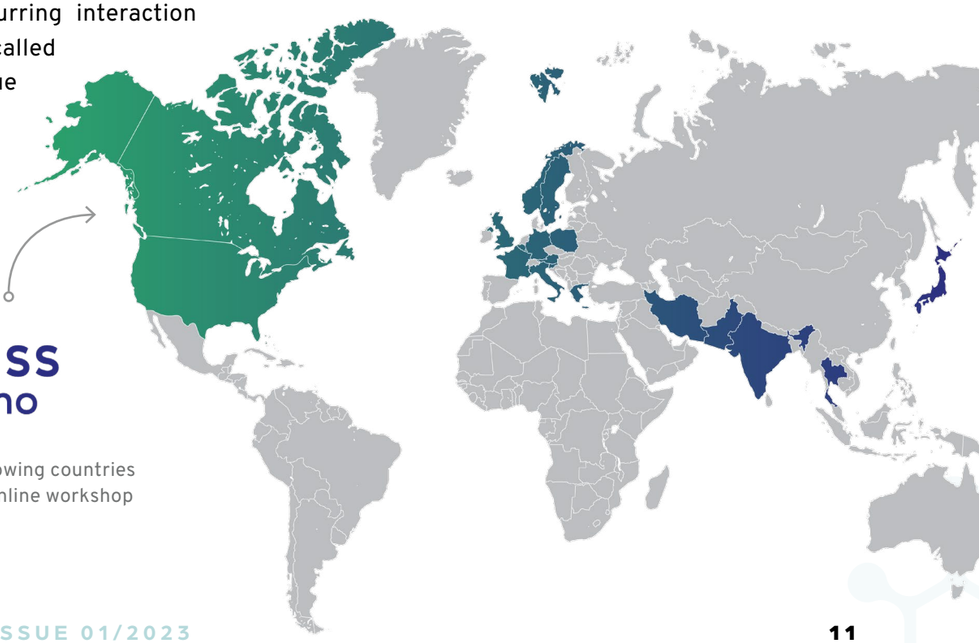
Participants of the Stakeholder Workshop at the European Commission in Brussels

Workshop "International Nanosafety and Nanostandardization: Status, Gaps, Needs and the Role of INISS"

The online workshop “International Nanosafety and Nanostandardization: Status, Gaps, Need and the Role of INISS” on 16 February 2023 was the first in a series of thematically focused interactions organized by the INISS-nano initiative. It attracted 65 people from 20 countries (Austria, Belgium, Canada, France, Germany, Greece, India, Iran, Italy, Japan, Luxembourg, Malta, Norway, Pakistan, Poland, Slovenia, Sweden, Thailand, United Kingdom, United States of America).

Ali Beitollahi (Iran Nanotechnology Innovation Council) initiated and planned this workshop. As the co-leader of INISS-nano-Pillar “Harmonization”, he gave the welcome speech and introduced the INISS-nano. His talk was complemented by the presentation about the periodically occurring interaction format, the so-called “EU-Asia Dialogue on Nanosafety”, giving an outlook on its aims and collaboration prospects by Alexander Pogany (Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology, BMK, Austria). The introductory talks concluded with the INISS-nano-Pillar “Harmonization and Standardization”, and its aims activities and programs by Ali Beitollahi.

Diving into the topic of standardization, the “Needs and Gaps on Nanosafety Standardization” from the perspective of a standardization body, namely ISO/TC229, were shown by Denis Koltsov (Chairman of ISO/TC229). This made clear how many synergies the global collaboration contains, and that dedicated activities and programs are relevant to step



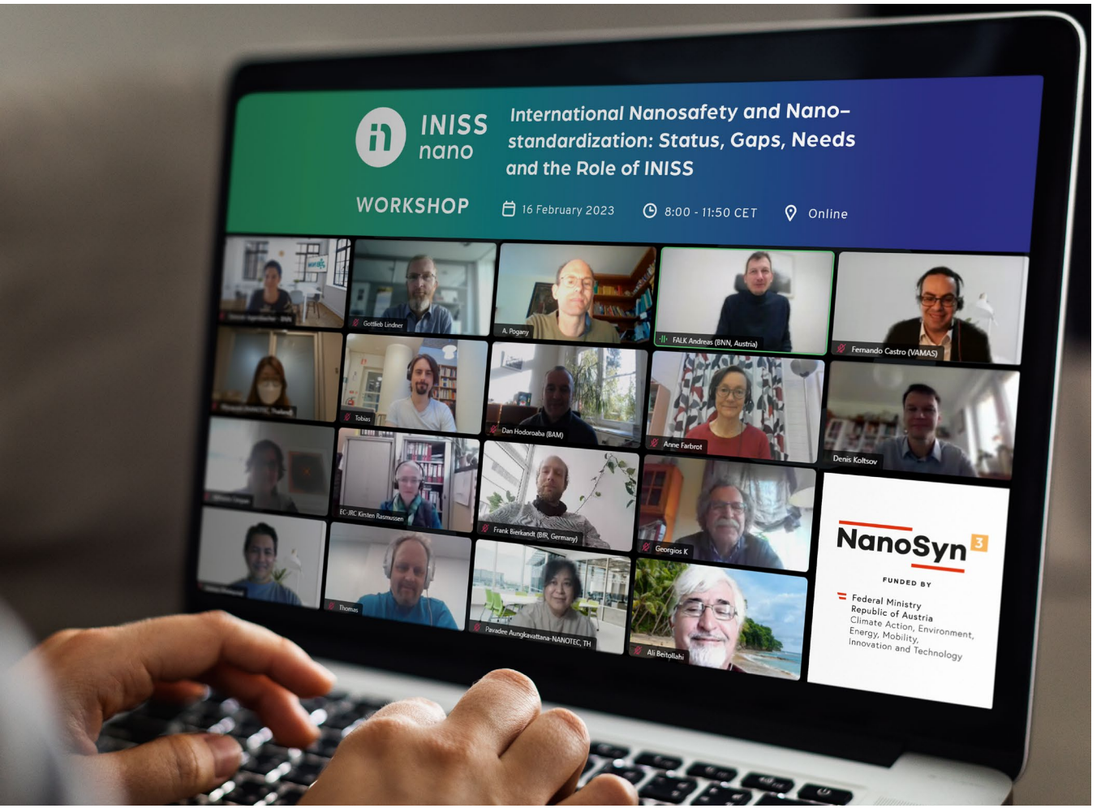
People from the following countries participated in the online workshop

forward with this – a perfect bridge to the presentations about “OECD WPMN Activities and Programs on Nanosafety and Nanostandardization” by Monique Groenewold (Chair of OECD WPMN), VAMAS - Programs and Activities by Fernando Castro (Chair of VAMAS), and about the Malta Initiative: Activities, Aims, and collaboration perspective with INISS, by Alexander Pogany (chair of the Malta Initiative).

Finally, a vivid panel discussion on steps ahead and a Q&A session with Ali Beitollahi, Georgios Katalagarianakis, Georges Favre, Denis Koltsov, Monique Groenewold, moderated by Andreas Falk, concluded the meeting.

All those aspects built a perfect starting point for the interactions of the participants towards identification and framing of the needs and gaps on capacity building/clustering, harmonization, nano-characterization, etc. Those interested can still fill out their survey by 27 March 2023, close of business.

The presentations are available for download on the BNN website. If you are interested in learning more about INISS-nano, please have a look at the publication.



BioNanoNet General Assembly & BNN Networking Event

Our BioNanoNet General Assembly and BNN Networking Event took place on 2 March 2023 at Lendhafen Graz, Austria.

For more than 15 years, the BioNanoNet community has been coming together at our regular “Networking Events”, enabling our members to hear about up-to-date trends, developments in the R&D&I-landscape and funding opportunities, and to make valuable connections and establish collaborations. One of the strengths of these meetings are the personal contacts that are gained and/or renewed; especially now, after 3 years of restricted physical interactions, we were grateful to be able to offer the networking event in a physical format with specific presentation opportunities and dedicated time for personal interaction! A key success factor of our BNN networking event is getting to know the competences and research interests of our members. To foster this exchange, the second part of the event was dedicated to our BioNanoNet members to present their key competences in the frame of “advanced materials”.

The BNN Networking Event, which focussed on "Advanced Materials in the European R&D&I Ecosystem", was preceded by the General Assembly of the BioNanoNet Association.

The Networking Event involved three parts:

In the first part entitled “Strategies, Funding and Networking in the Advanced Materials Field” we had the pleasure to listen to three renowned speakers on the following topics:

- “Advanced Materials for Innovation Markets - AMI2030” given by Lars MONTELIUS, Co-chair of AMI2030; former Director General INL, Lund University
- “M-ERA.NET 3: ERA-NET for Research and Innovation on Materials and Battery Technologies, Supporting the European Green Deal” given by Roland BRANDENBURG, Head of Transnational Initiatives at FFG Austrian Research Promotion Agency, and
- “Biomaterials for Health Applications” given by Konstantin SIPOS, RESCOLL & Chair of EUMAT-group Biomaterials for Health

The second part, “Science and Research – Pitches for Collaboration” was dedicated to an interesting presentation about the “Collaboration with the JRC in HEU-Projects and Beyond” given by Hubert RAUSCHER, European Commission Joint Research Centre, Technologies for Health. This talk was followed by presentations of Fundamental & Applied Researchers from members of the BioNanoNet Association.

The last part “Focus on HEU-WP 2024” included presentations of relevant call topics and face-to-face interaction.

The Networking was rounded off by a nice get-together over fingerfood and drinks.

NanoSyn 3

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Materials Innovation Markets Driven by Science and Research

Andreas Falk interviewing Lars Montelius in the BNN office in Graz, Austria

Lars Montelius during his interview at the BNN office

Focus Interview with Lars Montelius

For our Focus interview related to the Materials Innovation Markets, BNN CEO Andreas Falk invited Lars Montelius to our office in Graz to discuss his role in AMI2030 and the future of nanoscience. Prof. Montelius is Co-Chair of AMI2030, former Director General of the International Iberian Nanotechnology Laboratory (INL) and former Professor of Nanoscience at NanoLund. This is an excerpt: the full interview can be found on YouTube.

Andreas Falk: The Advanced Materials Initiative is very much linked to your name. How did the idea come about to create the AMI2030?

Lars Montelius: There is a challenge with nanotechnology or advanced materials: both are suffering from the fact that people (like politicians) do not really understand what they are. If you speak about digital communication, artificial intelligence, etc. they may have some kind of feeling what it is, but when we speak about nanotechnology or advanced materials – they don't really get it.

So I think there is a need to engage, of course, but there's also a need to connect the different dots. Every society has relied on our ability to master materials. We had the Stone Age, we had the Bronze Age, we had the Silicon Age. Now we're living in the age where we actually can tailor material properties more or less atom by atom or molecule by molecule. Not by chance, but by precision.

This has been a development over the last 50 years or so, which has been tremendous. But now in the next decade, we need to speed up a bit and then we need to make innovations that are unified. Because in the past, every kind of innovation was done in each sector, and that takes about 30-40 years. But now I think we need to work together.

And I have one interesting example for that. There has been a lot of discussion about interdisciplinary research. Most often there is a scientist in one subject that is maybe saying, I'm doing something that could be of, let's say, medical interest. So I contact someone from the medical faculty and then you can hijack that person's abilities to help you. And then what happens with this person over here?

Well, he or she gets more things to do because it's peripheral to what they do by themselves. So it's not really interdisciplinary – it is using other people's disciplines, which is nice, but it's not really moving forward together. And I think this is what we try to do with the AMI2030 initiative, is to bring people together, to do things together that will be beneficial for everyone, not only for hijacking one subject or someone else.

I see the point, and this is exactly what I would also relate with nanosafety, nanotoxicology, nanotechnology in general: characterization items, use of data, all these aspects. And of course they are addressed in AMI2030 in specific parts. So, in the end, nanoscience, nanotechnology will feed into AMI2030.

I think so. I mean, you can call nanotechnology being a sub-part if you like, but I think it's more horizontal, in a way. I think it captures all kinds of different things.

In the end, it's about our ability to tailor material with a certain specific function or intention. To design the material that will actually end up in a product or a service on the market. I think this ability to do that is the call of [AMI2030] and we need to speed up the development. In Europe, we are good when it comes to advanced materials manufacturing and we are good at some topics, but we're not really good at other topics and we are moving away from having a leading position in the world.

Nothing could be more meaningful than putting your efforts into materials science because it will change society.

So we need to speed up, and one way to speed up is to work together. There is this old saying that if you would like to get something done quickly, do it yourself. But if you would like to go far, do it together with others. And I think that's why we need to work together here.

Which are the most-needed skills and people for the future?

The young generation of today, they're looking for meaningfulness. And nothing could be more meaningful than putting your efforts into materials science because it will change society. You could pave the way away for a total green society, without any carbon footprint. A really resilient society. And here I think there is a chance to have a lot of re-skilling of all the people in the field, but also to skill the new people to actually understand how they can contribute.

It's the connectivity between different things. So you need to be specialist somewhere, but then it's the connectivity of, let's say, the AI or the machine learning together with the deep sciences and the deep knowledge in different fields. And you need to be a connector.

So I like to see this like a world map with different competences in different boxes, and in between there are a lot of white spots. So the total known area is mapped and all the other 99% is unknown. And if you reach out and start to move in these white areas you will actually take the first steps instead of following in other people's footsteps. You take the first steps and here you create the innovation. The innovation is in interfaces – and the interface may not be immediate. It could be a big area between, but it's really to trying to find these white spots where there is a lot of invention power that may lead to innovation.

This brings me to the part that, at the end, a systemic change is needed to be able to implement it. Which means some governance structures need to be rethought. What groups of stakeholders do you think are the crucial ones along that road? Who has the responsibilities and who will bring some pressure to it?

If you read the AMI Manifesto that was done a year ago, then it was very clear that it's for all stakeholders, so we need to connect. It's not only about the deep science people, not only the people in industry, but also the people on the street.

You mentioned the word "meaningfulness". I just want to come back to that. I think this is a crucial one, and it's also in the core of the AMI2030, of course. Which skills, which disciplines can support to create meaningful things for the future, and in which way?

This is an excellent question. Meaningfulness is very important and I think the, the aspiration of AMI2030 is really about that – meaningfulness as the glue for connecting.

And I think this connecting glue means that we need to connect with people having different kinds of knowledge. I don't think we can deselect something, and say, we don't need that. Because we need everything. It's a little like when you're building a society, you need someone that is good at making something with tin, or you need someone that can repair your teeth…

So you build a society with different kind of [skills], and this is the same thing here. I think here Europe has a chance to actually build something together. Because we are united and we have a lot of shared values in Europe that we could use and then bring everything together. And then also to connect in new ways.

There is shareholders' capitalism and stakeholders' capitalism. This is much more stakeholders' capitalism. It should be beneficial for everyone – but that doesn't mean it's not beneficial for the shareholders, because they are needed to put emphasis on expenditures, etc. etc., and to create new companies with new jobs. So it's a need for having a really good trusted connection.

→ WATCH FULL INTERVIEW

CONTRIBUTION FROM ACIB

Let’s develop innovative bionanomaterials – get your free trial!

Are you part of a company or research center that is eager to develop innovative bionanomaterials? Are you part of the value chain from biomass via bionanocomposites to bionanomaterials? Then let’s join forces and work together in the Open Innovation Test Bed (OITB) of Bionanopolys!

Our OITB network offers a holistic service portfolio to develop innovative bionanomaterials and provide them with requested properties for industrial use. The aim is to manufacture innovative bionanocomposites from sustainably sourced feedstocks in Europe as well as bio-based nanoproducts for packaging, textiles, agriculture, cosmetics, pharma or food.

This service portfolio includes 14 upgraded pilot plants (technical services), which oversee the extraction of raw materials and production of nanoadditives, which are dedicated to the production of bionanocomposites, and which intend to obtain bionanoproducts. These rather technical services are going to be supported by process parametrization (e. g. modelling, in-line monitoring) and complementary services that assist the companies into the route to market (e. g. safety validations, life-cycle and techno-economic assessments, business and legal support).

How can you access a tailor-made service package for your particular demand? The Bionanopolys open call has launched: interested entities can apply for a free trial by registering to our user platform (www.bionanopolys.eu/open-call). Applications should fit to the Bionanopolys scope and start with a technology readiness level of TRL 3 – 4 in order to end up at TRL 6-7 after implementation.

The deadline for submissions will be 30 April 2023. Subsequently, our Bionanopolys evaluation team will score all the received applications according to the evaluation criteria established in the applicant guidelines.

Then five applications will be selected and the OITB team will prepare an individual service package for each of them.

Contact

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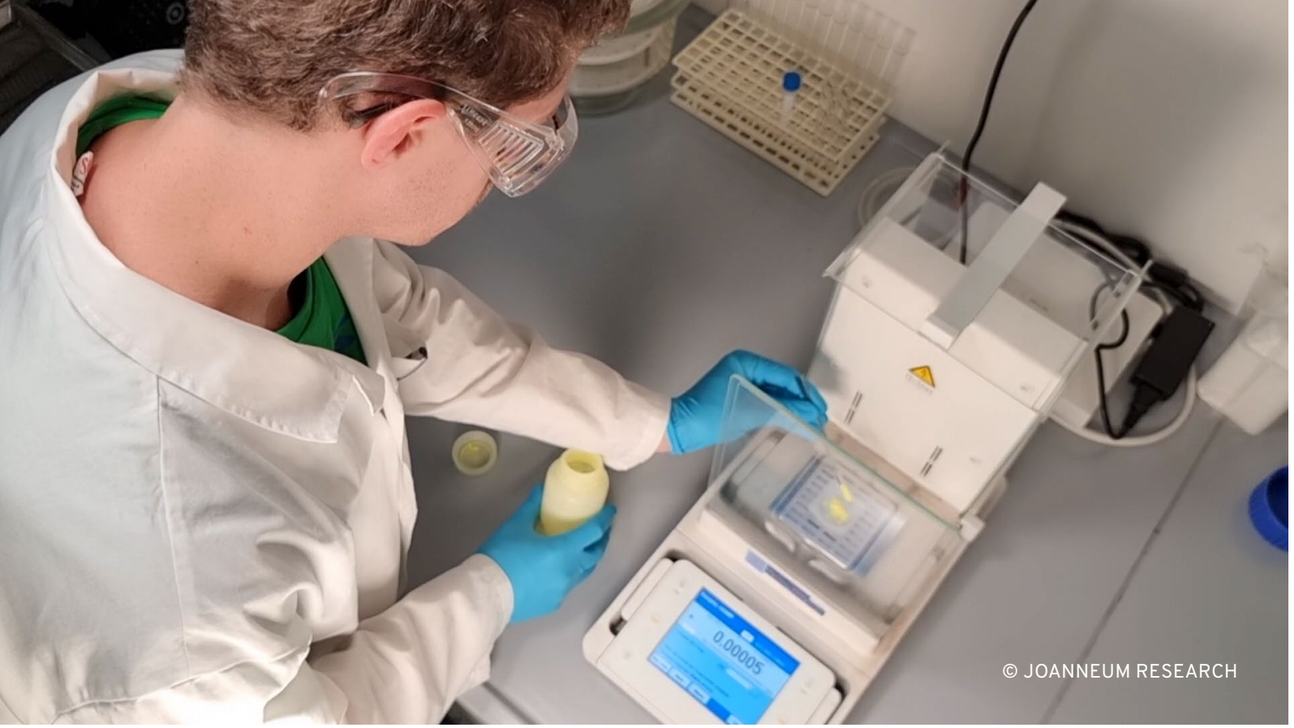

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CONTRIBUTION FROM
JOANNEUM RESEARCH – MATERIALS

Novel technology to increase pot life of Silicones used in LED components

Researchers at the MATERIALS Institute developed a formulation for a Silicone elastomer that can lead to significantly reduced production costs for LED components. JOANNEUM RESEARCH is looking for partners in the LED, phosphor and silicone market to exploit the potential of this technology.

Most LED components use special silicones (PDMS) as matrix for the color conversion phosphors, or as the favorite material for primary optical lenses attached to the LED package.

In LED production, two-component systems are used that start curing immediately after they are mixed. The mixture usually has a pot life limited to a maximum of few hours at room temperature, which leads to serious practical and technological limitations for its use.

Researchers at the JOANNEUM RESEARCH Institute MATERIALS have developed a novel method for stabilizing PDMS elastomers.

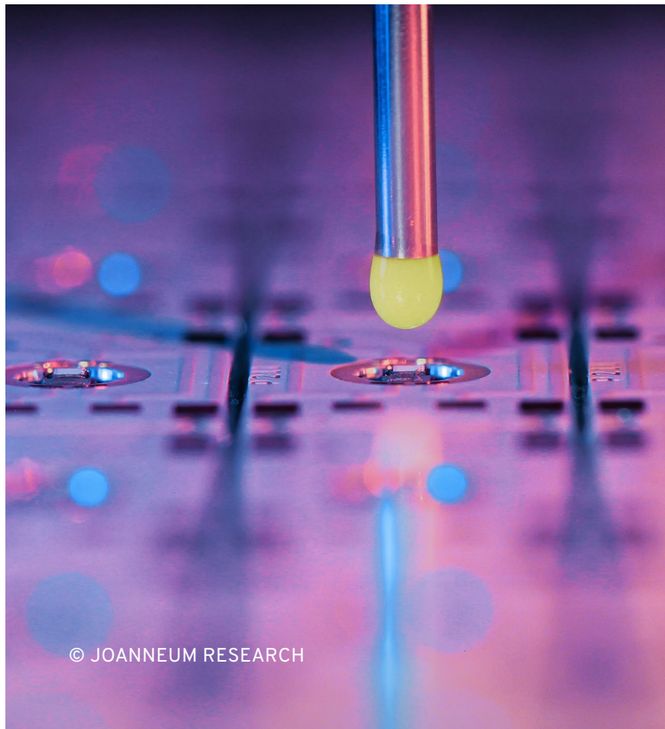
Using this technology, the pot life of silicon mixtures (including color conversion phosphors) of a few hours can be extended to several months. This is reducing the processing efforts and increasing the yield of color conversion material in LED-production considerably. After deposition, normal curing occurs at temperatures even below 80°C, leading to a fast and complete curing. No changes of optical properties of the PDMS and the LED components are observed.

A specific advantage of this approach is that the modified silicones can be mixed with colour conversion phosphors in rather large batches, increasing the accuracy and consistency of the color conversion pastes.

The novel technology is patent pending. We are looking for partners in the LED, phosphor and PDMS market to exploit the potential of this technology.

More information: Press release and SupresilTM-Website

JOANNEUM RESEARCH develops solutions and technologies for a broad range of industries and public agencies and is engaged in top applied research at an international level. Optimally embedded in the national and international innovation network our staff develops innovations in the three thematic areas of information and production technologies, human technology and medicine, society and sustainability.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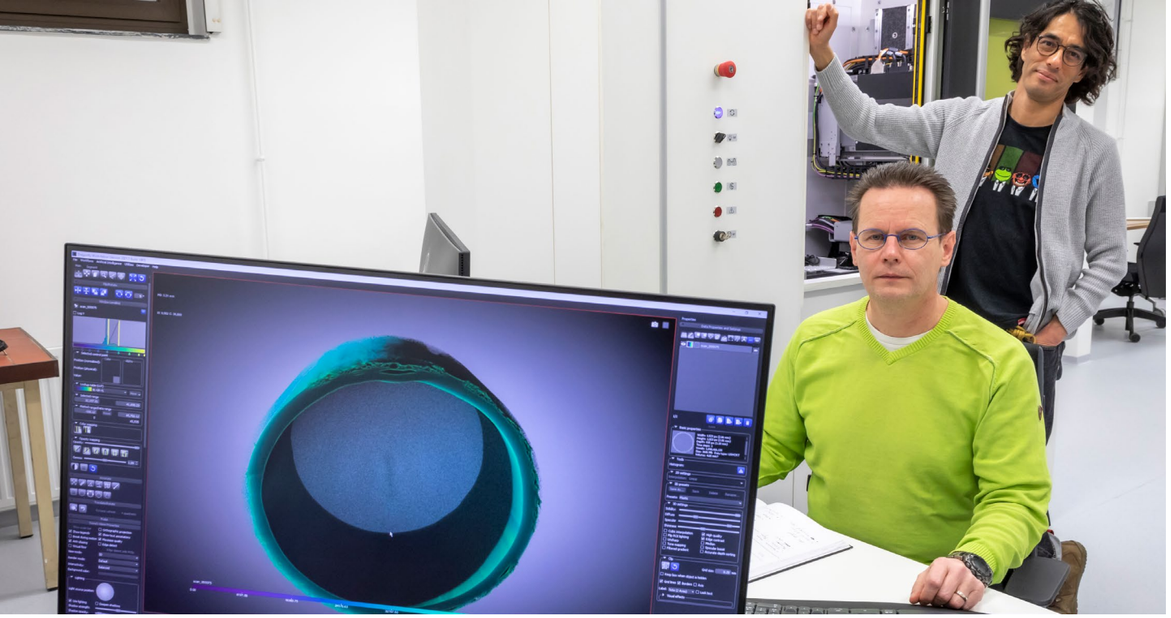


Lab manager Robert Schennach and senior scientist Eduardo Machado Charry. © Lunghammer – TU Graz

CONTRIBUTION FROM GRAZ UNIVERSITY OF TECHNOLOGY

Micro–CT Lab: Looking Deeply into Material Structures

Since the innovative Micro–CT Lab at TU Graz went into operation in 2022, researchers from TU Graz, Uni Graz and the Med Uni Graz have been working together examining material structures.

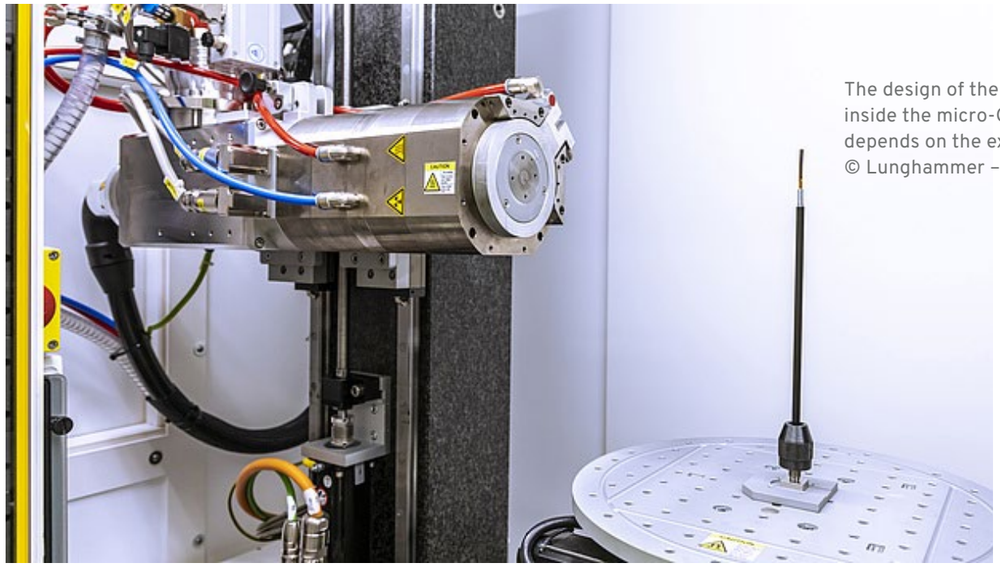
From the outside, the two new cabinets are inconspicuous. Rather big. White. Each one with a viewing window and a sample stage. But the unspectacular exterior is deceptive. The cabinets contain two powerful micro-CT chambers initiated by the inter-university Graz-µCT consortium (TU Graz, Uni Graz and MedUni Graz) and funded by the Austrian Research Promotion Agency – FFG. "With these devices, we can look deeply into the material structure of a sample without destroying the sample," explains Eduardo Machado Charry. The senior scientist at TU Graz is responsible for the equipment, prepares the samples and designs the experiment set-ups. In addition, he also partly takes care of the data analysis afterwards – an incredible amount of work, as Robert Schennach, researcher at the Institute of Solid State Physics and head of the consortium, explains. "You have to imagine, each of our measurements produces enormous amounts of data. Several gigabytes of data have to be processed per test."

But how does this data actually come about? Depending on the research question, different experiment setups have to be designed. As an example, the researchers want to investigate the effects of water on paper at different moisture stages. "With our micro-CTs, we can measure in situ with high temporal resolution," explains Schennach.

To do this, however, the required amount of water must be brought inside the unit and the process must run – a challenge to the experiment design that must first be overcome. But basically, “Each material sample is mounted on a rotating sample holder and spins while being bombarded with X-rays. This gives us a three-dimensional image of the sample that can be visualized on the computer and allows us to look into the material structure," explains Machado Charry.

The two devices – Tescan UniTom HR and XL – examine the material samples non-destructively and thus complement other measurements wonderfully, for example with electron microscopes. "The electron microscopes admittedly achieve a higher resolution.

Our devices stop at approx. 800 nanometres. But our measurements are wonderfully suitable for getting an overview of the structures and preparing, for example, the expensive investigations at a synchrotron." Samples such as concrete, paper and rock can be examined, as well as biological materials. "Biological materials are of course damaged by X-rays to some degree – no method is perfect, but at least we’re getting close," says Machado Charry with a smile. Measurements can take a few minutes or several days – so far the researchers have limited themselves to measurements of around six hours.



The design of the sample holder inside the micro-CT chamber depends on the experiment setup. © Lunghammer – TU Graz

A carbonized Kapton sample which will be bombarded with X-rays in a few moments. ©Lunghammer – TU Graz

In any case, the laboratory box with material samples is well stocked. For example, volcanic rock is currently being investigated together with the Austrian Centre for Electron Microscopy and Nanoanalysis (FELMI-ZFE), new concrete compositions with the Institute of Technology and Testing of Construction Materials, including changes to concrete pipes and charging and discharging processes in batteries.

Trials are currently being implemented mainly by the 13 partner institutes of the consortium.

"But we also allocate time for experiments with external partners and are happy to look at new research questions," says Schennach, inviting other research institutions and companies to collaborate.

Contact

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Volcanic rock sample is examined together with the FELMI-ZFE. ©Lunghammer – TU Graz

Member Updates

MEMBER INTERVIEW

ILF Consulting Engineers Austria GmbH with Alexandre Pazos


ILF Consulting Engineers Austria GmbH in Rum, Austria

ILF is a leading international engineering and consulting group with a focus on supporting clients in energy, industrial, and infrastructure projects. They have a long-standing history of more than 55 years and a deep commitment to improving quality of life around the globe, sustainability as well as the reduction of ecological footprint and pollution. In the chemical industry, ILF plays a crucial role in optimizing production processes and reducing emissions. ILF uses its extensive expertise to help clients increase efficiency and reduce the impact of their operations on the environment.

Alexandre Pazos is Head of Process Engineering & Consulting at ILF Austria, dedicated to driving innovation and implementing sustainability in the chemical industry. He works closely with clients to identify areas for improvement, and to develop and execute strategies to achieve their sustainability goals.

BNN: Why did you decide to become a BioNanoNet Association member, and what do you expect from the membership?

I got to know BioNanoNet Association and SusChem by talking to Bettina Mihalyi-Schneider (professor at the Technical University of Vienna and chairwoman of SusChem-AT). She explained the mission and values of SusChem and I found it so inspiring and important that I immediately contacted one of the Managing Directors of ILF Austria. As the values and mission were common and shared, he supported the idea of becoming a member from the very beginning. Our main expectation from being a member of BioNanoNet is to actively contribute to the transformation of the chemical industry into a sustainable industry.

Sustainability is a core value of BNN. What strategies have you implemented to improve your organization's sustainability?

Sustainability is a core value for ILF as well, starting with our CEO, Mr. Klaus Lässer, who personally leads many of our initiatives and strategies in this field. As a company, we have recently published our 2022 sustainability report, which will serve as a reference for our immediate actions. Our near-term goals are to reduce Scope 1 and 2 emissions by 50% and Scope 3 emissions by 40% by 2030. We are implementing several changes to our company's facilities and our vehicle fleet, as well as reducing our business travel and employee commuting. By 2040 we would like to achieve net zero emissions by reducing our total emissions by 90% and offsetting residual emissions.

As an engineering company, we are more conscious and demanding of the jobs we accept. Specifically, in the sector in which I work, the chemical industry, we strive to find technical solutions that reduce energy demand and the amount of resources, maximize energy efficiency and heat integration, recycle material (circular economy), replace non-renewable sources with renewable ones, and reduce emissions, effluents and waste.

We work to replace toxic and hazardous chemicals, design fit-for-purpose facilities and apply strict health, safety and environmental standards. We seek to honor our profession with high ethical standards, following professional (and ILF's) code of conduct as well as ILF values, mission and beliefs.

Our Focus Topic this issue is the Materials 2030 Roadmap. Does your organization address any of the Materials Innovation Markets (MIMs)?

No, at least not directly. Once these materials become available as commercial products/solutions, ILF always uses and supports novel and advanced technologies that improve the quality of life.

What led you to your profession?

By chance. I wanted to study physics, but shortly before I applied to university I met a

chemical engineering student. Talking to him, I decided to study chemical engineering, as it was a good mix of mathematics, physics and chemistry. The disappointment would come later, when those subjects became secondary in the third year of my degree and the subjects were focused on engineering topics. I became interested in my profession again during my final project and first years of work: process simulation and design of chemical facilities were what reconciled me with my profession.

What does your typical workday look like?

There really is no typical workday. There are days I may spend from morning until the end of the day in meetings (internal and external) and other days I may spend all day writing technical reports, performing calculations or reviewing the work of others. And, of course, anything in between. It is so variable, it is not unusual for me to check my agenda the night before to know exactly what I have to expect the next day. Some days it can be exhausting, but I cannot complain about having a monotonous job. It is really diverse and colorful.

What's the best aspect of your job?

What I appreciate most is the great autonomy I have to perform my duties, which leaves significant room for a creative approach, as well as the possibility to positively influence (to a certain extent) our society and the world we live in.

What would you advise a young person considering working in your field?

Many things, but probably the most important ones could be the following:

- ✔ Be critical and think for yourself
- ✔ Continuously re-assess your work and conduct and learn from the past
- ✔ Don't adjust your standards to accommodate your past decisions

Who are people in your field that inspire you?

Instead of naming important and well-known figures, I would rather put the focus on the people around me. I feel fortunate enough to find many role models among my colleagues, clients and former university professors. To name a few: Bettina Mihalyi-Schneider (Professor at TU Wien) for her uncompromising commitment to sustainability, Erich Schmidt (ILF Senior Consultant) for his mentoring of younger engineers or Walter Tesch (former ILF Director of Special Projects and Technologies and currently working at OMV as CCU Advisor) for his human focus and placing importance on teamwork.

Don't adjust your standards to accommodate your past decisions

However, the people who have had the most profound impact on my work and work ethic are my grandmother (my mother's mother), my mother and my wife. These three women have been and continue to be the people who have most influenced my career and have instilled in me the importance of a job well done, responsibility for my actions, critical thinking and the importance of work-life balance.

5-second answers

What was your dream job when you were a kid?

I guess astronaut, because I was crazy about space.

If you could study anything (new) right now, what would it be?

Philosophy

Office, home office or hybrid?

For me, office. But home office and hybrid are great advancements.

Which book have you most enjoyed reading lately?

Controlling Technology: Ethics & The Responsible Engineer by Stephen H. Unger

Limits and Beyond: 50 years on from The Limits to Growth, what did we learn and what's next? by Ugo Bardi and Carlos Alvarez Pereira

If you could make any activity an Olympic discipline, in which would you win a medal?

None at all. I don't think I excel at anything. But at the end of the day, the world has been built by normal people.

What is your motto?

"Shoshin", meaning "Beginner's mind". This is a concept from Zen Buddhism meaning attitude of openness, eagerness, and lack of preconceptions when studying a subject, even when studying at an advanced level, just as a beginner would.

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MEMBER INTERVIEW

ANALISIS-DSC
DYNAMIC & SECURITY COMPUTATIONS

ANALISIS–DSC with Laura Torres

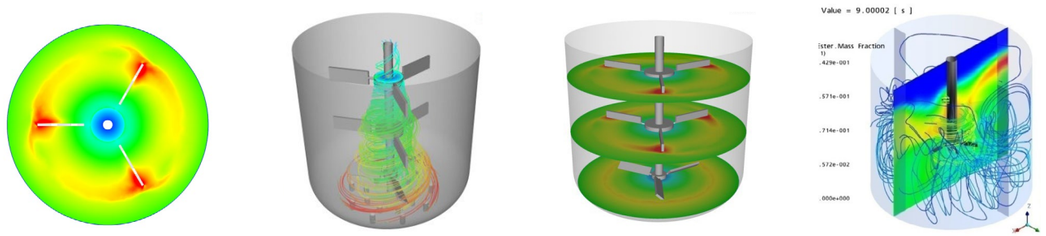
ANALISIS–DSC is a Spanish engineering SME in the area of mechanics and industrial processes, focusing on the areas of fluid mechanics (CFD), heat transfer, mechanical–structural (FEA) and granular flows (DEM) using CAE software tools.

Specifically, we work in:

- ✔ **Basic Engineering**
- ✔ **Failure Engineering**
- ✔ **Products and Industrial process Optimization**
- ✔ **Industrial Process Scale-up**
- ✔ **Heating, Ventilation and Air Conditioning (HVAC)**

We participated as partners in the H2020 SPIRE project about process intensification (IbD). Currently we are participating in 4 European H2020 projects: ASTEP related to solar thermal energy, BioSPRINT about biorefineries, NanoPAT related to nanotechnology and DIY4U about FMCG customization. Additionally, we are currently involved in 2 Horizon Europe projects: DIVINE related to agriculture and EXCEED related to mining. Finally, we have been awarded another project in energy to be started in April 2023.

Here is an interview with Laura Torres of ANALISIS-DSC.



CAE Simulations

From the left: Daniel Martin, David Arnanz, Jeronimo Domingo, Laura Torres and Juan Enríquez from ANALISIS-DSC

BNN: Why did you decide to become a Bio–NanoNet Association member, and what do you expect from the membership?

We would like to show the applications/analysis that are possible to provide with CAE (Computational Aided Engineering) services and how useful they are. We would like to share our knowledge and experience in nanotechnology, as we are partners in the NanoPAT H2020 project. Moreover, we would like to meet other companies in other countries and collaborate with them in the development of projects, including European projects.

Sustainability is a core value of BNN. What strategies have you implemented to improve your organization's sustainability?

We are an engineering services company and sustainability is implemented as our colleagues are doing home office.

What led you to your profession?

I wanted to be part of a big multinational company and wanted to be an important part of its decision-making.

What does your typical workday look like?

I start reviewing my emails, and from there I develop many different tasks, contacting potential clients, participating in B2B, preparing documents, preparing some social media contents and sharing them, participating in video-conferences of European projects, helping my CEO, etc.

What's the best aspect of your job?

Having the flexibility to do my work and being able to make decisions.

What would you advise a young person considering working in your field?

Be open to doing many different tasks and learning many things.

Who are people in your field that inspire you?

Managers of big, well-known multinational companies.

5–second answers

What was your dream job when you were a kid?

To be a teacher

If you could study anything (new) right now, what would it be?

Translation for many different languages

Office, home office or hybrid?

Hybrid

Which book have you most enjoyed reading lately?

Böses Blut (Bad Blood) by Robert Galbraith

If you could make any activity an Olympic discipline, in which would you win a medal?

100m running

What is your motto?

Try to do your best in all you do.

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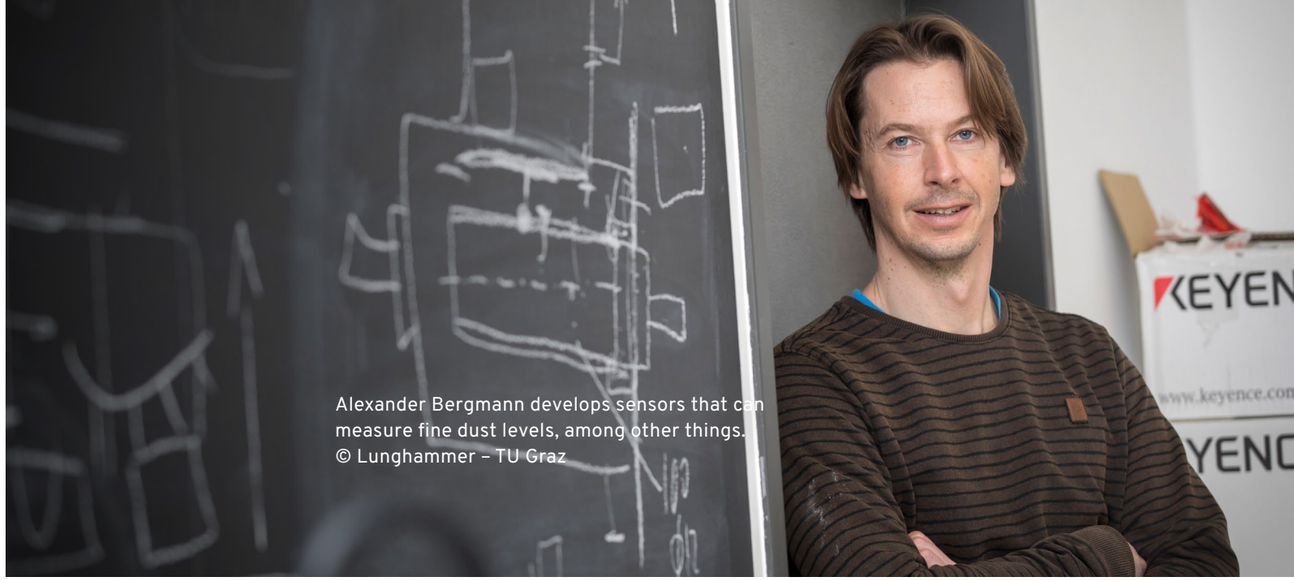


Alexander Bergmann develops sensors that can measure fine dust levels, among other things.
© Lunghammer – TU Graz

GRAZ UNIVERSITY OF TECHNOLOGY

Particulate Matter Measurements for Better Air

Alexander Bergmann and the team at the Institute of Electrical Measurement and Sensor Systems are developing sensors with which they can detect the smallest particles in our ambient air. This is extremely relevant, especially for the measurement of particulate matter levels and the assessment of air quality. Among other things, Bergmann and his team have developed the world's smallest particle sensor, which, with a size of 10 x 10 x 3 mm^3, performs like a conventional measuring system and can be built into everyday objects such as mobile phones. In this way, the current air quality can be determined at any time without great effort. At the center of Bergmann's place of work – Graz – the problem of particulate matter is omnipresent.

Read the whole article here.

PAYER GROUP

PAYER: Innovation. Yesterday. Today. Tomorrow.

Innovation drives us since 1946

To achieve our vision ONE PAYER TO BE NUMBER ONE, we attach great importance to the highest quality and innovative solutions at all levels. It is our goal that this aspiration is also perceived beyond our company boundaries. Therefore, we have modernized our website and brought it up to date. View the website here.

PAYER GROUP

Official Opening PAYER Malaysia

On 7 February 2023, PAYER Group officially opened its new Malaysian site in Sungai Petani, Kedah – PAYER Industries Malaysia Sdn Bhd.

"I am very pleased that we now officially open our newest location of the PAYER Group together in a ceremonial setting. The expansion of our global setup is a strategically important step for the diversification of our supply chain in Asia. I would like to thank all employees whose commitment helped us to achieve all steps on time," emphasized Michael Viet, CEO PAYER Group, in his opening speech.

Read the whole article here.

TECHNISCHE UNIVERSITÄT WIEN

SUSNANOFAB Final Networking Event

Focused on Sustainable Nanofabrication, the 2-day event took place in Technische Universität Wien, Vienna, Austria, from 23–24 February 2023.

Renowned actors in the nanofabrication ecosystem worldwide joined the debate to discuss the most relevant topics regarding sustainable nanofabrication and nanomanufacturing. The agenda included a panel of speakers from the industry, innovation and research arenas, in sessions dedicated to all the stakeholders in the sustainable nanofabrication value chain.

See the event here.

MEMBER UPDATES

JOANNEUM RESEARCH, MATERIALS

Photonic Quantum Computer: Computing with Light

Femtosecond Laser Processing of Integrated Quantum Optical Chips (FLMOptChips)

Researchers from the MATERIALS Institute at JOANNEUM RESEARCH recently received approval for a 1.3 million Euro quantum technology project. The aim is to develop optical chips for a photonic quantum computer that enables direct quantum computing with photons. Physicist Bernhard Lamprecht is project leader of FLMOptChips at the institute's site in Weiz, Austria. The production of these optical chips takes place exclusively there.

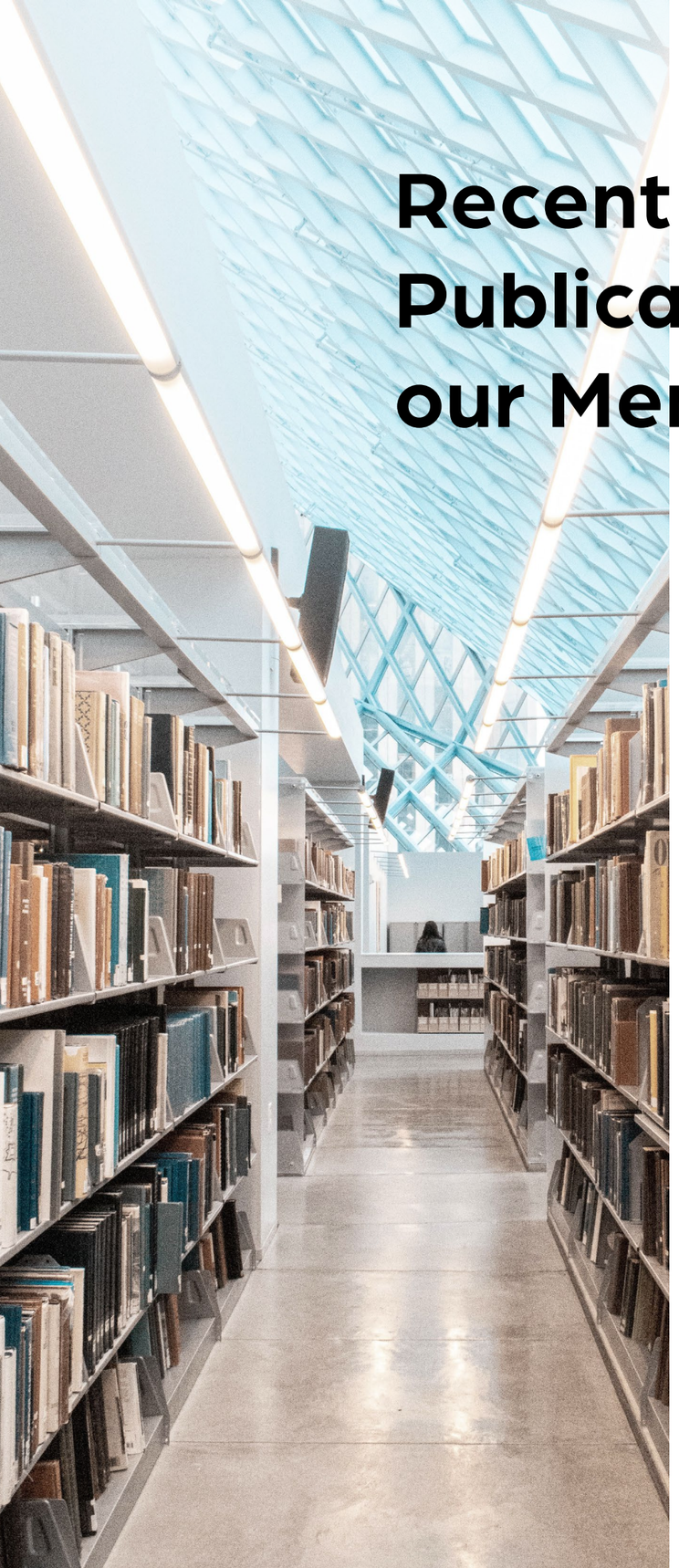
Read the whole article here.

JOANNEUM RESEARCH, HEALTH

Smart4Fabry: Using nanotechnology to combat Fabry disease

The HEALTH Institute of JOANNEUM RESEARCH is a research partner in the EU project Smart4Fabry. The aim is to develop the basis for a new drug to treat the rare metabolic Fabry disease – a hereditary disease in which organs are damaged because certain substances cannot be broken down in the body.

Fabry disease is a rare inherited disorder that affects one in 40,000 people. It belongs to the group of lysosomal storage diseases for which there is currently no definitive cure. Without treatment, it progresses steadily. Those affected lack an enzyme that is necessary for the breakdown of waste products in the cells. The metabolic disease leads to deposits in the blood vessels, which subsequently causes changes and damage in various organs such as the heart, lungs, kidneys or the central nervous system. Read the whole article here.



Recent Scientific Publications of our Members

Take a look at the latest publications of our BioNanoNet Association member sent to us from 2018 to February 2023 by downloading the document BioNanoNet member publications.

All BioNanoNet members are invited to send us their recent publications to info@bnn.at to promote them in our network.

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Project Presentations & Updates

NMBP–16 Ambassadors Meeting

To discuss the scientific progress within the three NMBP-16 sister projects (DIAGONAL, HARMLESS, SUNSHINE) and evaluate the status quo of our inter-project collaboration, representatives of the six Task Forces met again on 16 Jan 2023, this time virtually.

The online meeting was moderated by Susanne Resch from BNN (responsible for Stakeholder Engagement in DIAGONAL). It offered a great opportunity to exchange the progress update on each Task Force, to discuss joint activities between the three projects, and to define the next steps for the upcoming months.

Role of BNN in DIAGONAL:

Mainstream Sustainability into Safety-by-Design, Liaison management, Stakeholder engagement, Communication & Dissemination

Role of BNN in HARMLESS:

Safe Innovation Approach, Stakeholder engagement, Graphic Design, Communication & Dissemination

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The NMBP-16 projects have received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement n° 952924 (SUNSHINE), n° 953152 (DIAGONAL), n° 953183 (HARMLESS).

Future–proof Approaches for Risk Governance – Lessons Learned from Nanotechnologies

The key topic of this conference was to present and discuss how to support shaping international approaches in addressing future challenges in risk governance of nano- & advanced materials. This includes Safe-and-Sustainable-by-Design (SSbD), as well as harmonization and standardization. The conference took place at the OECD Conference Centre in Paris 24-25 January 2023.

The main aim of this event was to ensure that results from the three H2020 NMBP-13 projects - Gov4Nano, NANORIGO and RiskGONE - are taken up to support the implementation of the Chemical Strategy for Sustainability (CSS), and to address future challenges in risk governance of new and advanced materials. These three projects joined forces to address the same goal: to ultimately ensure that a sustainable and equitable nano risk governance infrastructure is developed in Europe and beyond. While each project has had its own unique approach and objectives, all have shared common goals and visions strengthened by constructive cooperation involving all stakeholders. The project partners' long history of research to understand the impacts of nanomaterials on human health and the environment, and their participation in major European and national projects dealing with these topics, has ensured a strong, comprehensive knowledge base and engagement with key stakeholders. The partners have worked together to develop and establish a robust public policy framework for the use of nanomaterials, based on scientific evidence supporting a clear understanding of risks, their assessment, and management within wider societal considerations. The projects have coordinated activities in the following topics:

- ✔ Effective risk governance for advanced (nano)materials through developing a guidance framework and proposing a new organization to complement and work with existing initiatives
- ✔ Developing and consolidating tools, instruments and guidance for all stakeholders' use through an online portal
- ✔ Pursuing FAIR data management
- ✔ Developing new approaches for harmonization and standardization of advanced (nano)materials

This has been achieved through inter-project working groups and engagement and consultation with a broad spectrum of key stakeholders from NGOs, industry, research organizations, EC, EU Member States and international organizations such as the OECD.

Interactive roundtables were used to present and discuss key project results and recommendations with a broad international audience of relevant stakeholders. The outcomes from these discussions are expected to complement and support the work of other stakeholders and initiatives on risk governance of nano- and advanced materials. During the two days, four round tables took place on (i) harmonization and standardization, (ii) risk governance portal and tools, (iii) FAIR data, and (iv) organization of risk governance. All participants were encouraged to actively contribute to the round table discussions.

Next to the roundtable discussions, Jürgen Tiedje from DG RTD gave a presentation highlighting the way forward with advanced materials and related initiatives.

One week later, on 31 January, all roundtable outcomes were presented to a broad online audience. The recordings of this online session are available here.

The conference was organized by the NMBP-13 projects Gov4Nano, NANORIGO and RiskGONE in collaboration with the OECD's Working Party on Manufactured Nanomaterials (WPMN), supported by the EU project NANOMET.

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement n°814401.

Connect with Gov4Nano:

SEE WEBSITE

BNN joins European Project NABIHEAL in biomaterials for complex wound healing

The Horizon Europe project NABIHEAL, coordinated by the Center for Biomedical Research Network (CIBER), led by Prof. Nora Ventosa of the Institute of Materials Science of Barcelona (ICMAB-CSIC), was launched 11-12 January 2023 in Barcelona with the first meeting of the international consortium. BNN is among the 14 beneficiaries from 7 countries, including research centers, universities, and private companies. Further BioNanoNet Association members involved in the project include CIBER (Spain), the Institute for Medical Research and Occupational Health (Croatia), MyBiotech GmbH (Germany), and Nanomol Technologies S.L. (Spain).

NABIHEAL stands for “Antimicrobial **Na**nostructured **Bi**omaterials for Complex Wound **Heal**ing” and is funded under the Horizon Europe Research and Innovation programme with a total budget of nearly 5 million euros over four years. NABIHEAL aims at solving two unmet medical needs in complex wound healing: on the one hand, affordable treatments for wound infections and prevention of complications during wound healing, and on the other, a strategy to optimize the composition and efficacy of wound dressings.

The kickoff meeting, held at the CSIC Researcher’s Residence in Barcelona, was opened by the project coordinator, Prof. Nora Ventosa, from CIBER and ICMAB-CSIC, and by institutional and political representatives, including Riccardo Rurali, Vice-Director of ICMAB-CSIC; Ramon Martínez Mañez, Scientific Director of CIBER-BBN; Jordi Aguasca, Director of Technological Transformation and Disruption Unit, ACCIÓ; and Xavier Aldeguer, General Director of Society of Knowledge, Transfer & Territory of the Catalan Government. Each partner and Work Package leader then presented his/her expertise and plans for the project. The meet-ing provided the opportunity to interact in person with all the consortium partners and establish the first collaborative activities to ensure timely delivery of the project milestones.

Complex wound healing as a global health problem

The NABIHEAL project will advance on the synthesis of advanced nanostructured biomaterials as an alternative to the commonly used silver-based materials. “The project will work to produce multifunctional materials for the treatment of complex wound healing, which has become a global health problem. For example, in developed countries, it affects the quality of life of more than 2% of the total population,” affirms Nora Ventosa, coordinator of the project.

Complex wounds, such as chronic wounds, are highly susceptible to microbial infection and biofilm formation, and thus difficult to treat. The most common antimicrobial products to treat these infections are based on silver. However, they have several economic, environmental and safety drawbacks. The biomaterials developed within the NABIHEAL project will offer a safer, more sustainable and more cost-effective alternative.

Members of the EU-funded project NABIHEAL during the kick-off meeting in Barcelona on 11 January 2023.

The project aims to obtain innovative multifunctional wound healing biomaterials using affordable EU-based manufacturing technologies. In the long term, NABIHEAL could become a game-changing alternative to silver in wound healing dressings.

An International Consortium

The goals of the project will be tackled by an interdisciplinary consortium, combining expertise in different areas, such as synthesis and characterization of biomaterials, biocompatibility and safety, regulatory aspects and ethics, or wound healing product development and scale-up. “We are excited to launch this project, in which 8 academic institutions and 6 private companies will join forces to face the challenging problem of complex wound treatment,” adds Prof. Ventosa.

Role of BNN in NABIHEAL

Within the project, BNN leads the task to elaborate NABIHEAL’s Safety-and-Sustainability-by-Design (SSbD) concept and guidelines for all (nano)materials and processes of the different technologies developed within the project. Furthermore, BNN serves as Work Package Lead for WP8: Communication, Dissemination & Exploitation, which entails creation of the project branding, website, printed materials, and maintaining the social media accounts. In addition, BNN guides partners in disseminating and exploiting project results.

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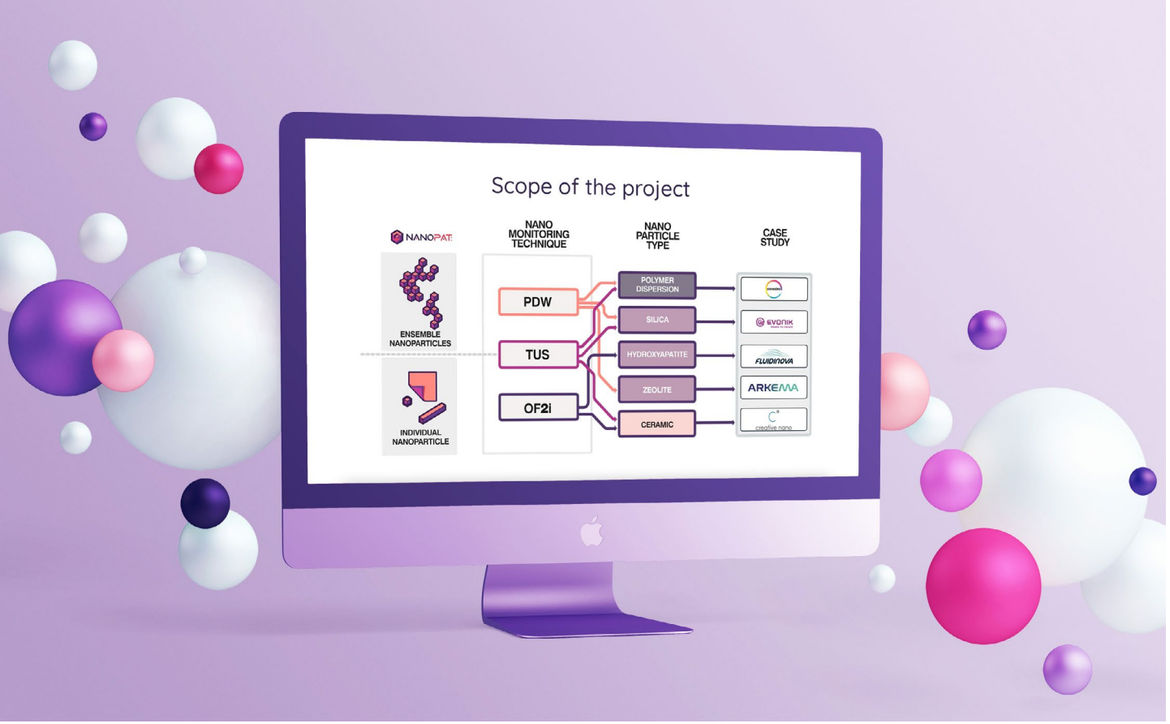
This project has received funding from the European Union’s HORIZON EUROPE research and innovation programme under grant agreement n°101092269.

SEE WEBSITE



NanoPAT's project videos released

NanoPAT is pleased to introduce two project videos to showcase our activities to find online real-time characterization solutions for nanoparticle production processes!

Watch the project video presenting the main concepts and ideas behind the project here.

The second video gives an overview of the three Process Analytical Technologies (PATs) that we are developing in the project - watch it here.

Both videos are available on the NanoPAT YouTube channel.

Role of BNN

Training, Graphic Design, Communication & Dissemination

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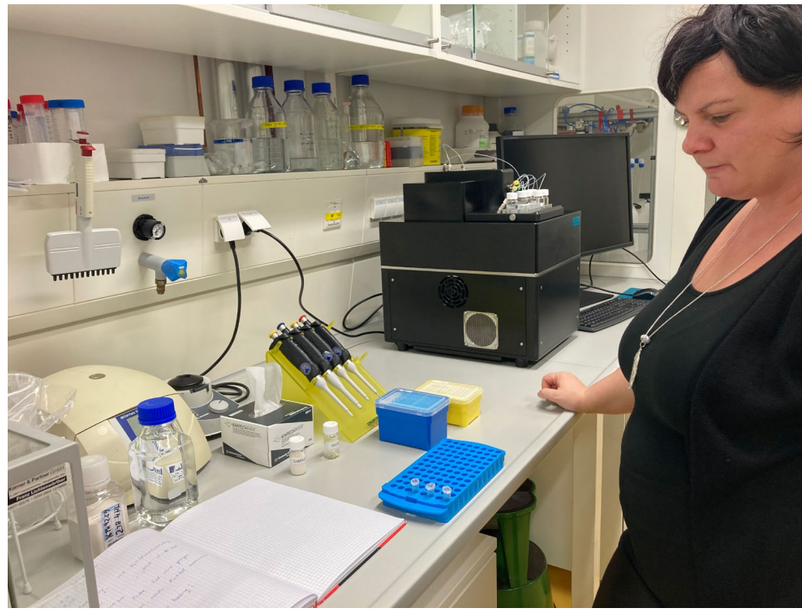
This project has received funding from the European Union's HORIZON 2020 research and innovation programme under grant agreement n° 862583.

Connect with NanoPAT:

SEE WEBSITE

NanoPAT success story: OF2i leaps from PAT to research

BRAVE Analytics has been a partner in the NanoPAT project since 2021. We have been developing the patented OptoFluidic Force Induction (OF2i) method for process control of products containing particles. This involves working with our NanoPAT partners in industry, Fluidinova and Creative Nano, to fine-tune the new particle sizing method for their applications. Small-scale simulated installations have been built to test the performance of OF2i with the products; on-site installations will follow soon. The pilot installations bring BRAVE's PAT sensor one step closer to market maturity, with product launch planned for the end of 2024.



The NanoPAT project is the springboard to launch OF2i as an online particle sizing method for industrial production. It was the focus of the company from day one, implicit in the project name of the PAT sensor: "B1". However, as the NanoPAT project progressed, we realized the full potential of the OF2i method. It can do much more than continuous monitoring of particle size and particle concentration in production processes. As a spin-off of the Medical University of Graz and located on campus, we've had many fruitful conversations with researchers in various biomedical fields. In the last two years we've also had requests for measurements on our "beta device" and have seen the potential for a laboratory nanoparticle analyzer based on OF2i.

OF2i in medical research

Two research groups at the Medical University have been among the first to use the OF2i device for research in the laboratory. One study focused on monitoring the molecular processes involved in protein-protein and protein-ligand interactions in order to optimize drug delivery for treating Alzheimer's and other

age-related diseases. Another study used OF2i to track the change in particle concentration over time to the observe the behavior of medical formulations in an acidic environment.

Although there are many differences between continuous monitoring of production processes and observing particle behavior in the laboratory, the leap is not that large. Like the PAT sensor, the BRAVE lab analyzer also measures continuously, just from a limited volume in a vial. Continuous measurement means it can analyze particles passing through the flow cell over several minutes and even hours. At an analysis rate of up to 4000 particles per minute from a sample volume of several milliliters and upwards, results delivered by OF2i have a high statistical relevance.

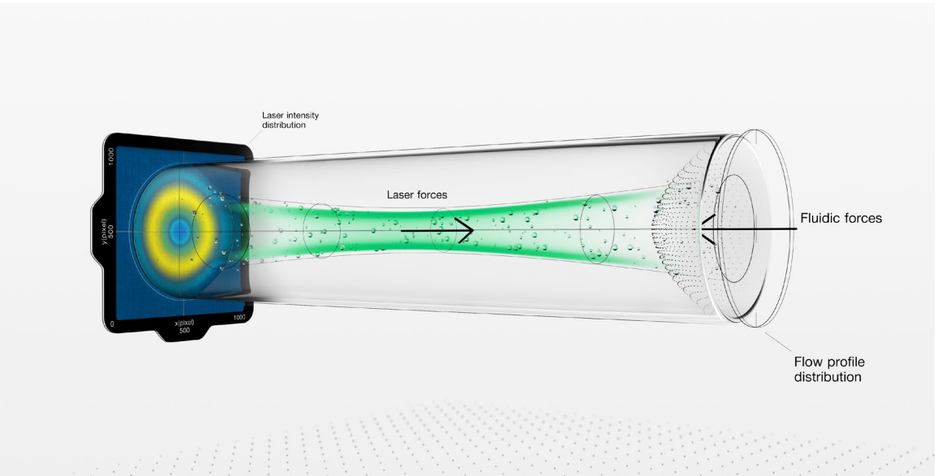
Investigating nanoplastics

Last year, researchers at a nearby Austrian university applied OF2i to investigate nanoplastic leaching. As OF2i is well-suited to detecting ultra-low numbers of particles in a medium, it was used to measure the very low concentrations of nanoplastic particles leached out of PPE bottles into water. In measurements over 50 minutes OF2i could detect the very low but significant number of particles.

In a future installation another Austrian research group plans to couple the device to an ICP-MS. We will work with them on the setup so they can capture, sort by size and concentrate nanoplastic particles before monitoring the size and particle concentration alongside other ICP-MS measurements.

A potential game changer

Considering the established methods on the market, BRAVE Analytics knows there is no “one size fits all” answer for particle analysis. Where we see the benefit of OF2i is in its capability for time-resolved measurements. Having a continuous measurement of particles in the lab is revolutionary for observing and understanding sample kinetics. We also see huge potential for OF2i wherever ultra-low particle concentrations need to be measured and captured. The one huge benefit of OF2i in a PAT sensor is that it means particle size and particle concentration can be now monitored directly during production. This is a quantum leap from the tedious waiting for lab results while production runs, with the inherent risk that the finished product will not meet the specifications and fail the final batch testing.



OF2i measuring principle

Inside workings of BRAVE B-Continuous PAT sensor (beta version)

New names, new innovations

BRAVE’s laboratory nanoparticle analyzer will be launched at the beginning of March and has recently been renamed BRAVE B-Curious after being “B2” throughout the development project. The original B1 PAT sensor, now renamed BRAVE B-Continuous, is planned for launch at the end of 2024.

Alongside moving to bigger premises on the Medical University campus, launching the lab analyzer and taking part in several conferences and exhibitions this year, the research continues. We are working on two add-on Raman modules as an extension for both the lab device and the online sensor. These modules will enable identification of substances via Raman spectroscopy and particle analysis on trapped particle populations. Exciting times!

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This project has received funding from the European Union’s HORIZON 2020 research and innovation programme under grant agreement n° 862583.

Connect with NanoPAT:

SEE WEBSITE

BRAVE B-Curious nanoparticle analyzer for research and product development

The BRAVE team on-site at the Fluidinova premises in Portugal, checking the tanks before test installation

PHOENIX–OITB co–organized stakeholder workshop: Nano2Clinic – Synergies for Clinical Translation of Nanotechnology in Cancer Therapies

Nanotechnologies fundamentally change the current therapies and enable development of novel treatments and diagnostic approaches. The improvements in medical therapies and diagnostics achieved through innovative medical nanoproducts have a significant and direct clinical impact and provide benefits for the patients. Hence, best practices in design and development of such nanoproducts will contribute to societal prosperity and welfare, by providing access to safer and more effective treatments.

On 3 March 2023, the EU-funded project PHOENIX-OITB (including BNN and BioNanoNet Association members Institute for Medical Research and Occupational Health, as well as others), co-organized a stakeholder workshop with the COST action Nano2Clinic and H2020 SENDER project to strengthen relations between industry, R&D&I sector, regulatory agencies, clinics, and patients with the ultimate goal of fostering the clinical translation of nanomedicine from bench to bedside. By promoting scientific exchanges, technological implementation and innovative solutions, the meeting yielded dialogue for rationalizing and focusing research efforts at the EU level in dealing with the challenge of nanomedicine translation for cancer therapies.

Several speakers presented on a variety of topics, from best practices in clinical translation of orphan nanodrugs to regulatory aspects in clinical translation of nano-enabled products to theranostic nanomedicine design. The informative event included lively exchanges during Q&As and during the breaks and following dinner. We were happy to welcome nearly 40 attendees in person in beautiful Zagreb!

For more information visit the PHOENIX OITB website.

Participants were treated to a surprise closing ceremony with traditional Croatian song and dance.

Organizer

NANO2CLINIC: Cost Action CA17140 - Cancer nanomedicine - from the bench to the bedside

Supported by:

PHOENIX-OITB: Pharmaceutical Open Innovation Test Bed for Enabling Nano-pharmaceutical Innovative Products

SENDER: Safe-by-Design Approach for Development of Nano-Enabled-Delivery Systems to Target the Brain

Local organizer:

Institute for Medical Research and Occupational Health, Zagreb, Croatia

Funded by the European Union

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BioNanoNet members and staff

Outlook

BNN EVENTS & EVENTS SUPPORTED BY BNN

BioNanoMed 2023

12 – 14 April 2023 | Graz, Austria

The 11th International Congress – BioNanoMed 2023 is the exclusive know-how-transfer meeting for researchers, engineers, students and practitioners from Natural Sciences, Medical Sciences and Engineering Subjects throughout the world.

NanoMedicine-Austria is very pleased to sponsor the Best Talk Award 2023!

The best presentation will be elected by an international committee and the prize of € 500 will be awarded in the closing ceremony of BioNanoMed 2023.

More information

CHASE Expert days & SusChem–AT–Day with the topic "Transformation toward sustainable process industries"

25 – 26 April 2023 | Linz, Austria

The next "CHASE Expert Day – Transformation towards Sustainable Process Industries" in cooperation with the national technology platform SusChem-AT (coordinated by BNN) is taking place in Linz. The event will start with SusChem-AT contributions covering "Sustainable Energy Supply for Process Industries". The following session is titled "New Technologies Enabling Sustainable Process Industries". On the second day the stage is set for contributions from industrial & scientific partners and the advances of CHASE employees.

More information

6th EU–Asia Dialogue on NanoSafety

21 June 2023 | Berlin, Germany

INISS-nano with the EU NanoSafetyCluster, the Asia Nano Forum and a local host are co-organizing the annual "EU-Asia-Dialogue on NanoSafety", a globally open communication event. Within this event, the progress of the actions planned in the INISS-nano initiative will be discussed, and a focus topic "The role of characterisation and how it is addressed in INISS-nano" will be the subject of our dialogue. Registration is open until 12 April 2023. Please note: the event will be held as physical meeting only.

More information

BioNanoNet Annual Forum & BNN Networking Session 2023

13 September 2023 | Vienna, Austria

Save the date for our BioNanoNet Annual Forum & BNN Networking Session held at TU the Sky in Vienna, Austria.

Finally

We hope you enjoyed reading the BNN QUARTERLY! Please don't hesitate to contact us if you have any suggestions or feedback.

Our next BNN QUARTERLY will be published in June 2023 and will focus on the topic **Leveraging new technologies for societal impact**. BioNanoNet members are welcome to send their contributions regarding this focus topic as well as articles about their scientific research until 12 June 2023! Articles on other topics can be published anytime on the BNN website.

Contact
info@bnn.at

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