



Editorial

Dear Readers,

The last two months have been very exciting for us!

In October, our participation in the **Symposium Polysaccharide-based Materials** at the XXI Brazilian Research Society (B-MRS) in Maceio, Brazil, marked the commencement of a series of events. The experience was invaluable, providing us with wonderful opportunities to **expand our collaborations** within a very active community in Brazil dedicated to materials and polysaccharides. Building on this success, we are now already planning a **second edition** of the Symposium for October next year, with the crucial support of the EPNOE Ambassador in Brazil, Prof. Elisabete Frollini.

In November, we joined forces with **FinnCERES**, **Treearch** and **B2BE Facilitator**, to co-organise the **Bioeconomy Innovation Day** in Brussels. The event, attended by over 90 participants, included members of the **European Commission**, **OECD**, **European Chemical Industry Council**, **Science Europe**, **policy-makers**, **investors**, representatives of **European governments** and **funding agencies** and **more than 20 companies and start-ups**. It was a great success, paving the way for more high-level events in the coming year.

At present, we are curating an exclusive portfolio of activities for our members. The **Working Group on Analytics of Polysaccharides** recently organised and conducted an **online workshop** on **"Challenges and Alternatives in Polysaccharide Analytics."**

With more than 80 participants, it was a wonderful opportunity to connect excellent scientists and companies together, and **discuss challenges and opportunities related to polysaccharide analytics**. We plan on organising an in-person workshop next year to promote discussion as well as collective actions, and to **work on the formation of consortia for project applications**.

Additionally, we are offering **office research activities** to our industrial members, as well as the possibility to organise targeted workshops to build or **support R&D activities within companies**.

We are going to launch more **activities for members** in January. Notably, a **Working Group** on **"Life Cycle & Sustainability by Design"** and a groundbreaking online activity, the **EPNOE Web-**

Together, which will facilitate presentations on career development, the cultivation of soft skills and the sharing of research presentations among EPNOE researchers.

Finally, we are glad to announce that the **Journal Carbohydrate Polymers** has recently accepted our **EPNOE Research Roadmap 2040** for publication! This is a meaningful accomplishment for us and all the scientists involved in this project.

Looking forward, our plans for the upcoming year include a Symposium at **ACS Spring meeting in New Orleans**, co-organisation of **2nd International Symposium on Cellulose and Renewable Materials (ISCRM)** in China and **Asian Polymer Association Conference** in India.

I hope you are convinced about the great value of being a member of EPNOE, and we eagerly welcome you to join us on this exciting journey!

Pedro Fardim

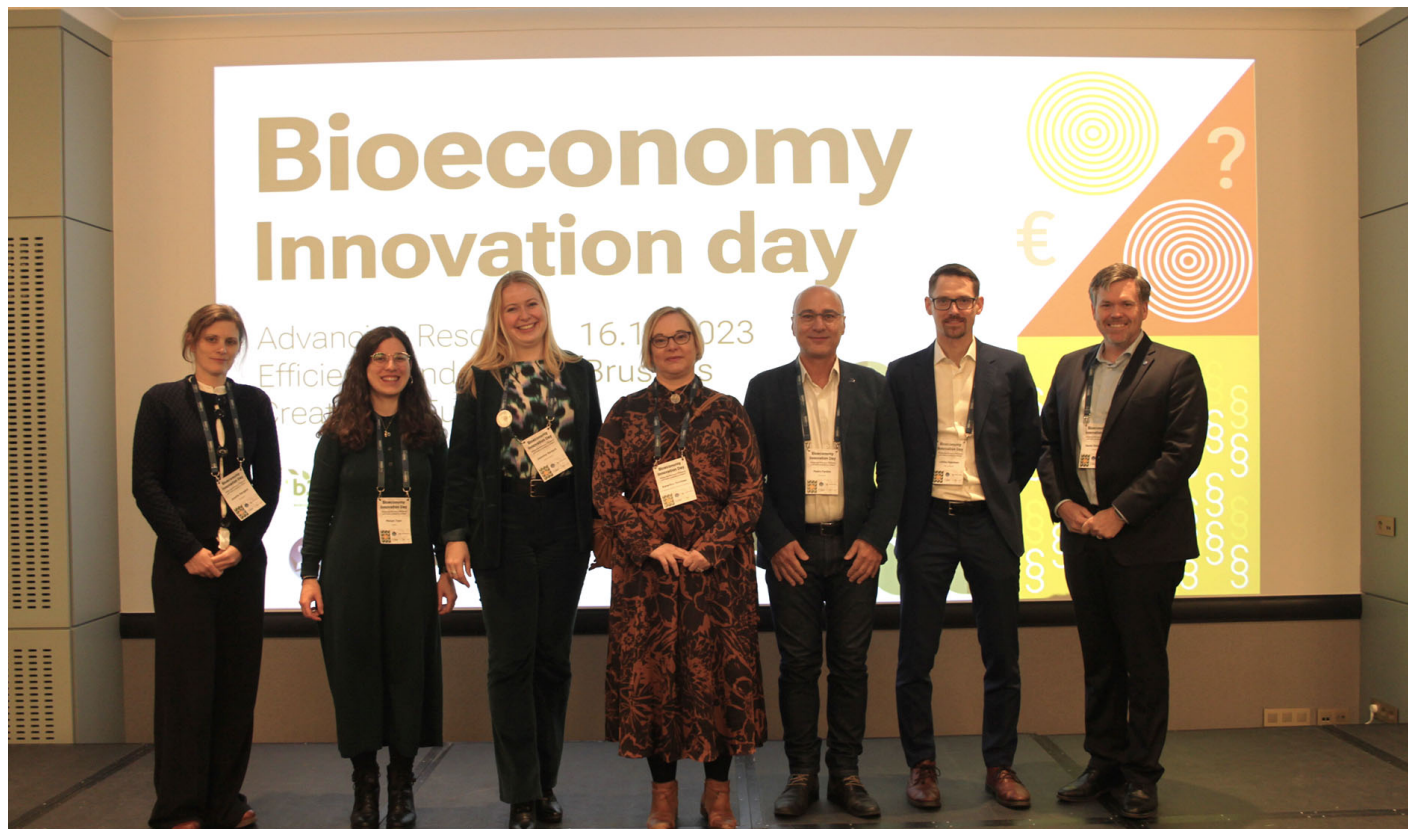
President of EPNOE **us on**

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News & Announcements

Bioeconomy Innovation Day: A Resounding Success!



The **Bioeconomy Innovation Day**, held in **Brussels** on **16 November**, was a resounding success! We had the immense pleasure of welcoming **high-level speakers, leading companies**, and **enthusiastic attendees**.

With the goal of delving into the ways in which the bioeconomy can advance the **green transition** and offer fresh insights into **cutting-edge circular bio-based innovations**, the 5 insightful sessions not only **added significant value** to this purpose but also laid the foundation for **engaging discussions** among diverse stakeholders.

We express our heartfelt gratitude to all the people involved in this successful Day!

EPNOE Workshop on *"Challenges and Alternatives in Polysaccharide Analytics"*



The EPNOE online workshop on *"Challenges and Alternatives in Polysaccharide Analytics"* took place on **8 November**. More than **80 members** joined us in an incredible event that aimed to **facilitate knowledge-transfer** and **networking opportunities**.

Exclusively for EPNOE Members who are interested in Polysaccharides Analytics, this initiative provided some **valuable insights** into different subjects.

The workshop consisted of **4 break-out sessions**:

- **Crystallinity**

Speakers: Paavo Penttilä, Alfred French, Tomas Larsson, Yoshiharu Nishiyama

- **Compositional Analysis**

Speakers: Chunlin Xu, Daniel Wefers, Robert Hollmann, Lukas Fliri

- **Molecular Weight**

Speakers: Katja Richter, Leena Pitkänen

- **Rheology**

Speakers: Bruno Medronho, Tatiana Budtova, Wenwen Fang

Join us for the upcoming activities and check out other membership benefits [here](#)!

Symposium Polysaccharide-based Materials at the XXI Brazilian Research Society (B-MRS)



The XXI Brazilian Research Society (B-MRS) Conference had **more than 2300 participants**, 453 oral presentations, 1794 posters and 158 invited lectures covering all fields of materials science and engineering.

The Symposium Polysaccharide-based Materials had 26 oral presentation and 57 posters. We had a great pleasure to have Prof. Elvira Fortunato, Minister of Science, Technology and Higher Education of Portugal attending talks in our session.

More information about the programme [here](#).

EPNOE at the Brazilian Centre for Research in Energy and Materials (CNPEM)



Pedro Fardim visited the Brazilian **Centre for Research in Energy and Materials (CNPEM)** in Campinas, Brazil. The CNPEM stands out in Brazil as an open, multi-user, and multidisciplinary center with activities directed toward different actors in the national science, technology, and innovation system.

CNPEM hosts four laboratories with focus on Synchrotron Light, Biosciences, Biorenewables and Nanotechnology and one School of Science, a multidisciplinary and disruptive undergraduate course in science, technology, and innovation. See more [here](#).

EPNOE and Brazilian Biorenewables National Laboratory of CNPEM are working together to organise an event about Bioinnovation in Brussels next year. Stay tuned!

HMC Announces First Molecular Weight Standards for Chitosan



Molecular weight analysis are always a challenge for polysaccharides. The choice of the right column system, the perfect eluent for the samples or the selection of detectors are fundamental questions that have to be solved in analytical laboratories.

There are currently no standard substances for many polysaccharides. The common method is therefore to use reference substances for calibration or to use expensive light scattering detectors.

In the field of chitosans, the German company Heppe Medical Chitosan (HMC) has launched a new product on the market. A standard set of different chitosans for molecular weight analysis. It contains 10 standards in the 18-530 kDa range.

A comparison with pullulan, PEO/PEG or PVP is therefore no longer necessary and deviations between light scattering results and RI detectors can be reduced from 300% to 30%.

Read more [here](#).

BOKU Opens New Christian Doppler Laboratory for Cellulose High-Tech Materials



On 2 June, the Christian Doppler Laboratory for Cellulose High-Tech Materials was inaugurated at the University of Natural Resources and Life Sciences (BOKU) in Tulln, Austria.

This new lab, led by Ass.Prof. Dr. Hubert Hettegger, is dedicated to researching the properties, characterization, sustainable production, and processing of cellulose-based materials. This initiative aligns with the principles of "Green Chemistry" and aims to advance knowledge in the field of renewable resource chemistry.

The laboratory's establishment is supported by the Federal Ministry for Labour and Economy (BMAW) and four Austrian corporate partners: Lenzing AG, Papierfabrik Wattens GmbH & Co KG, Metadynea Austria GmbH, and Vienna Textile Lab GmbH. The lab's research will benefit various sectors, including pulp, paper, fiber, textile, and other downstream industries, thus reinforcing Austria's industrial base.

The partnerships with leading companies highlight the lab's role in developing sustainable solutions and optimizing production processes in these industries. In line with BOKU's long-standing expertise in chemistry of renewable resources, the lab is set to tackle significant scientific challenges in cellulose chemistry. Doctoral students at the lab will be trained under the ABC&M (Advanced Biorefineries – Chemistry & Materials) doctoral school at BOKU, ensuring a deepened knowledge base in biorefinery chemistry.

Christian Doppler Laboratories are recognized for conducting high-level application-oriented basic research, collaborating with top scientists and innovative companies. The establishment of this lab is seen as a significant step in advancing sustainable industrial practices and research in Austria.

Figure caption: Hubert Hettegger @BOKU Media Center/Christoph Gruber

Prof. Orlando Rojas (The University of British Columbia) as a Guest Professor at BOKU



Prof. Orlando J. Rojas from The University of British Columbia (Canada) visited BOKU as a guest professor at the Institute of Chemistry of Renewable Resources.

He presented a lecture on “Principles and applications of biobased materials” from October 4th to 12th. The lecture series aimed to help grasp the fundamentals of bio-based polymers and composites from the viewpoint of Chemical and Biological Engineering.

We started with the basics of polymer structure, physics, and chemistry. Additionally, we introduced the structures and characteristics of these materials, and discuss how we measure these properties. We have also emphasized how processing, structure, and properties are interconnected, especially in relation to common uses of polymers and polymer-based composites.

Prof. Orlando Rojas is a professor and Canada Excellence Research Chair at the University of British Columbia, with joint appointments with the Departments of Chemical and Biological Engineering, Wood Science, and Chemistry.

He is an adjunct professor in the Departments of Bioproducts and Biosystems at Aalto University and Chemical and Biomolecular Engineering of North Carolina State University. His recent research grants include the prestigious ERC-Advanced from the European Research Council under the European Union’s Horizon 2020 research and innovation program.

Prof. Rojas works toward supporting global sustainable development through research on the fundamental and utilization aspects of renewable resources, including lignocellulose, proteins, and other biopolymers. His research aims to discover competitive alternatives for fossil materials.

Figure caption: Orlando Rojas

Prof. Hiroyuki Yano (Kyoto University) as a Guest Professor at BOKU



Prof. Hiroyuki Yano from Kyoto University (Japan) visited BOKU as a guest professor from September 6th to 18th. During this period, Prof. Hiroyuki Yano presented a lecture on “Current



Advances in Biomaterials”.

The lecture series included theoretical and interactive sessions held at the BOKU Tulln site. The course aimed to provide essential and comprehensive knowledge in the field of high-strength nanocellulose materials, cellulose nanofiber (CNF) materials, optically transparent CNFs materials, CNF-reinforced rubber and plastics, the “Kyoto Process” and the “Nano Cellulose Vehicle” (NCV), as well as CNF-reinforced bioplastics, LCA and materials recycling.

Moreover, the course offered insights into recent research at RISH (Research Institute for Sustainable Humanosphere, Kyoto University). Prof. Dr. Hiroyuki Yano heads the Laboratory of Active Bio-Based Materials of the Research Institute for Sustainable Humanosphere at Kyoto University.

After obtaining his Ph.D. in agricultural science (wood science) from Kyoto University (1986), he first joined Kyoto Prefectural University and later Kyoto University (1998) and became a professor in 2004. He has been involved in nanocellulose research since 2001 and was the president of the Japan Nanocellulose Forum (2014-2016).

His interests cover the application of nanocellulose-based materials for automotive and electronic devices. He is further well-known for his work on the Nano Cellulose Vehicle (NCV). In 2005, he received the prestigious Hayashi Jisuke Award from the Cellulose Society of Japan.

Figure caption: Hiroyuki Yano

University of Jena: M. Sc. Jens Tran joined the group as scientific coworker

M. Sc. Jens Tran joined the group as scientific coworker. He works in the field of polysaccharide derivatives for biomedical applications.

Events

Last Few Days to Register for the Upcoming EPNOE Webinar!



The upcoming EPNOE Webinar is taking place via **Zoom** on



Thursday, **7 December**, 13:00 to 14:30 (CET).

Michael Hummel (Aalto University) will be presenting a **Plenary Lecture** titled "Man-made cellulosic fibers – established and emerging technologies."

Ana Kramar (Universidad Carlos III de Madrid) will lead a **Research Lecture** titled "*Cellulose acetate nanofibers preparation using solution blow spinning: challenges and application perspectives.*"

This webinar is **free of charge**, but registration is mandatory. The registration deadline is **Tuesday, 5 December!**

Check out the webinars webpage [here](#).

Register now!

2nd International Symposium on Cellulose and Renewable Materials (ISCRM), Chengdu, (China), 20-23 September, 2024



Yuanyuan Li (KTH) is part of the Organising Committee of the 2nd International Symposium on Cellulose and Renewable Materials (ISCRM), taking place in Chengdu (China), 20-23 September 2024.

Pedro Fardim (EPNOE) will be one of the chair men, leading a great event which focuses on the latest scientific and technical advancements in cellulose and renewable materials, bringing together universities, research centers, technological institutions, companies, and passionate individuals.

Read more [here](#).

APA-EPNOE Conference on "Polymers for

Advanced Technology", Jaipur (India), 14-16 November, 2024



The Asian Polymer Association (APA) and EPNOE are co-organising a conference on polymers for advanced technology, in Jaipur (India), 14-16 November, 2024.

In association with Gujarat Fluorochemicals Ltd, this event will feature



two interesting thematic symposia:

- EPNOE Symposium on Functional Polysaccharides
- GFL Symposium on Hydrogen Energy & Storage

Read more [here](#).

Projects

Thermal Insulation Panels from Residual Wood Resources in French Guiana "PANneaux THERmiques Issus de la Valorisation des Ressources Bois Résiduelles de Guyane"



ANR project (2023-2027) coordinated by Julie Bossu, CNRS Researcher, UMR EcoFoG

PANTHER²Guyane aims to study the potential of a bio-insulation production chain adapted to the extreme hygrothermal conditions of French Guiana, based on the use of local residual wood resources.

Technically, the project is based on the hypothesis that the exceptional intrinsic properties of tropical wood fibres can be used to shape high-performance bio-based insulation panels for sustainable construction in tropical zones. By adapting a textile industry technique based on fibre felting, the consortium aims to produce semi-rigid, thick and lightweight non-woven insulation fiberboards with good thermal, mechanical, fire-retardant and durability properties.

Based on the most promising products, long-term demonstration tests will be carried out to generate a thermal behaviour model that takes into account the influence of high temperature and humidity specific to the Guyanese climate.

Alongside the technological model, this project will also aim to model the impact of the implementation of a fiberboard production line on the environment and the local timber industry. The interdisciplinary nature of the partnership and the development of innovative digital tools designed to federate and transfer the knowledge acquired to a broad community will enable us to understand the potential of this new value chain as a whole.

Based on all the results obtained, the final stage of PANTHER²Guyane will be to draw up a detailed roadmap for the implementation of an industrial-scale project in French Guiana.



BEST-CROP: an EU-funded project to deliver novel crops with enhanced photosynthesis and tailored straw for the circular economy

Funded by the EU's Horizon Europe programme, the BEST CROP project aims to enhance barley's photosynthetic capabilities and ozone assimilation, creating novel crops with tailored straws for industry.

The University of Milan, is leading a consortium of 18 European plant breeders, straw processors, and academic plant scientists aiming to use the major advances in photosynthesis to improve barley yield and to exploit the variability of barley straw quality and composition.

Read more [here](#).

University of Aveiro

NET4MAT: Building Knowledge and Tools for the Sustainable Microbial Fighting through Sensing and Responsive Polysaccharide-Based Materials

Start Date: January 2024

End Date: December 2027

NET4MAT is a project approved for funding under the call MSCA Staff Exchange 2022 and coordinated by Idalina Gonçalves, a junior researcher working at CICECO – Materials Institute of Aveiro, in the Department of Materials and Ceramic Engineering at the University of Aveiro (Portugal).

It will bring together a network constituted by 7 academic institutions and 5 companies involving early-stage/senior researchers that by sharing know-how will explore the feasibility of combining microbial sensing lanthanide-glycoclusters and antimicrobial porphyrinoids with biodegradable and biocompatible polysaccharide-based formulations, raising up a disruptive breakthrough towards on-demand development antimicrobial biodegradable plastics.

BOKU University

CD Laboratory for Cellulose High-Tech Materials

Funding Agency: Christian Doppler Forschungsgesellschaft

Start Date: 01.03.2023

End Date: 28.02.2030

The CD Laboratory for Cellulose High-Tech Materials focuses on sustainable cellulose-based materials, aligning with the principles of "Green Chemistry." It addresses the properties, characterization, production, and reprocessing of cellulose materials.

Recognizing the importance of green processes beyond just using renewable resources, the lab

considers process aspects like yields, solvents, additives, recyclability, energy flows, and environmental impacts to avoid superficial "greenwashing."

Key areas of research include the separation, analysis, purification, and derivatization of cellulose using supercritical CO₂; sustainable modification methods for cellulose and biomass; understanding degradation and aging in biorefinery and cellulose processing; advanced characterization of modified biomass and cellulose components at the molecular level; and general aspects of cellulose chemistry, including derivatization, reactivity, and chromophore chemistry.

Read more [here](#).

Waste2NewProducts: Black Soldier Fly Farming

Funding Agency: FFG - Forschungsförderungsgesellschaft

Start Date: 01.05.2023

End Date: 30.04.2025

In many countries, insects are used as a source of protein for human consumption or for feeding and breeding livestock due to their ability to be easily cultivated on a variety of organic substrates, thanks to their hardiness.

The Black Soldier Fly (BSF), particularly its larvae, stands out for its robustness and high conversion efficiency of up to 70%, enabling it to process a wide range of organic waste materials. However, to ensure optimal growth conditions for BSF larvae, it is of immense importance to properly formulate the feeding substrate.

Therefore, rapid and efficient analytical methods are being developed to quickly assess the composition of the supplied organic waste stream. Furthermore, the suitability of insect biomass as a raw material for producing various materials is being evaluated for its physical and chemical suitability.

Read more [here](#).

Lukasiewicz Research Network- Lodz Institute of Technology (Łukasiewicz-LIT)

Development of an Innovative Chitosan-Based Granulate with the Addition of Unique Biomodifiers, Intended for Processing Using the Extrusion Technique

Grant Number: POIR.04.01.04-00-0041/20

Funding Agency: Project financed from the National Centre for Research and Development

Start Date: 01.11.2020

End Date: 31.12.2023

The goal of the project is to develop at least one recipe and processing conditions for a new, biodegradable, stable, homogeneous plasticized chitosan granulate and/or composite containing chitosan intended for introduction to the Polish market. The production of unique derivatives of natural polymer, suitable for processing using techniques used for thermoplastics, will allow to increase the scope of application of these polymers on an industrial scale.

As a result of thermomechanical processing, the developed product will have significantly extended/different usability compared to the product currently obtained by wet processing. This goal will be achieved by using unique modifiers based on natural raw materials to plasticize the polymer. These modifiers will be designed and synthesized from available components, mainly from renewable sources.

The optimal chemical structure of the biomodifiers used will be determined, allowing to obtain a chitosan-based material with good processing and utility properties. The processing parameters of chitosan-based materials determined in laboratory conditions will be verified and optimized on a large-laboratory scale, and then on a quarter-technical scale using a pilot line dedicated to this purpose and developed as part of the project.

Based on the analysis of the literature, patent databases and the competitive environment, it was found that there are no solutions with the features of a new product. The recipients of the product will be producers of so-called occlusive dressings intended for the treatment of moderately hemorrhagic wounds, pressure ulcers, entry wounds, exit wounds and open chest wounds.

The Influence of Hybrid Carbon Structures on the Process of Cartilage/Bone Tissue Regeneration

Grant Number: UMO-2018/31/B/ST8/02418

Funding Agency: Project financed from the National Science Center

Start Date: 24.07.2019

End Date: 23.12.2023

The main goal of the project is to develop a biocompatible and bioactive hybrid implant of the latest generation, manufactured on the basis of fibrous structures - carbon nonwovens. The hybridity of such a material is mainly determined by the modification and functionalization of carbon materials.

By applying a ferromagnetic additive to the surface, later, more accurate diagnostics will be possible, thanks to the possibility of imaging such material after implantation. The functionalization of the implant will involve the physical deposition of polysaccharide (alginate and/or hyaluronic acid salts) to which peptides will be chemically attached. In this way, such a material will simulate the structure and functions of the intercellular matrix.

The topics covered in the work, the research methods used, the plan of individual research and the approach to the problem are innovative and unique on a global scale and result in the development of materials engineering and biomedical engineering, while also enabling the development of a new generation of materials.

Education

Welcome to New Students, Researchers, and Staff Members within EPNOE network!

Olga Ivanova, PhD student

- Institute: BOKU, Institute of Chemistry of Renewable Resources
- Supervisor: Rosenau/Hettegger
- Topic: Stabilization of Lyocell Dopes for Safe and Efficient Cellulose Fiber Production

Evgeny Spiridonov, PhD student

- Institute: BOKU, Institute of Chemistry of Renewable Resources
- Supervisor: Rosenau
- Topic: Modification of Cellulose

Jan Janesch, PostDoc

- Institute: BOKU, Institute of Chemistry of Renewable Resources
- Supervisor: Rosenau/Potthast
- Topic: Use of Renewable Resources in Material Applications

Stefanie Gross Belduma, PhD student

- Institute: BOKU, Institute of Chemistry of Renewable Resources
- Supervisor: Potthast
- Topic: Molar Mass Adjustment of Celluloses for Advanced Processing

Piyawan Yimlamai, PhD student

- Institute: BOKU, Institute of Chemistry of Renewable Resources
- Supervisor: Potthast/Beaumont
- Topic: Preparation and Characterization of Insect-based Nanochitin/Protein-Complexes

Open Positions

FSCN Research Centre at Mid Sweden University, Sundsvall Campus, announces four open positions in chemistry/chemical engineering on biobased materials:

- **PhD student in chemistry | miun.se**
- **PhD student in chemical engineering | miun.se**
- **PhD student (licentiate) in chemical engineering | miun.se**
- **PhD student (licentiate) in chemical engineering | miun.se**

Recent Scientific Publications of EPNOE Members

Check out the recent **[publications of our members!](#)**

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Forward to a
colleague



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