

PROGRAMME

# 18<sup>th</sup> MAPEX Early Career Researcher Workshop

SCIENCE MEETS INDUSTRY  
*Career path in(to) the industry*

1<sup>st</sup> October 2024  
AIB building (Hochschulring 40)

18

**MAPEX**

Materials Methods Technologies

**Early Career Researcher  
Workshop**



# Programme overview

1<sup>st</sup> October 2024

**8:30 Registration**

## **Session 1 Alumni talks**

**9:00** Welcome and introduction  
Dr. Enis Bicer / Dr. Hanna Lührs  
*MAPEX Center for Materials and Processes*

**9:15** Dr. Eike Volkmann  
*OHB System AG*

**9:30** Andre Abrath  
*BREWA wte GmbH*

**9:45** Dr. Daniel Otero Baguer  
*aisencia GmbH*

## **Session 2 Exchange with alumni speakers and MAPEX Team members**

**10:00** Conversation tables

## **11:00 Coffee break**

## **Session 3 Career talks**

**11:15** “In the end it makes all sense and is fun: my academic career between polymer electrolytes, silicon micromachining, and microbes on Mars”  
Prof. Dr.-Ing. habil. Sven Kerzenmacher  
*University of Bremen*

**11:45** “Multi-scale development of new biomaterials for tissue engineering”  
Prof. Dr. Dorothea Brüggemann  
*City University of Applied Sciences*

**12:15** Discussion on academic career paths  
Prof. Dr.-Ing. habil. Sven Kerzenmacher  
*University of Bremen*  
Prof. Dr. Dorothea Brüggemann  
*City University of Applied Sciences*

**12:45** **End of workshop / Joint lunch at mensa**

## Venue of the workshop

AIB building – Room 1020/30



Hochschulring 40  
28359 Bremen  
First floor

## Organising committee

Enis Bicer, Hanna Lührs, Touhidul Islam, Lena Ehlers

# Session 1 – Alumni Talks

9:00 Welcome and introduction

**Hanna Lührs, Enis Bicer**

*MAPEX Center for Materials and Processes*

9:15

**Dr. Eike Volkmann**

*Head of Materials, Processes and Cleanliness, OHB System AG*



**My current role:** Head of Materials, Processes and Cleanliness at OHB System AG

**Describing my daily work in one sentence:** Having the pleasure to lead and develop a great team of Materials, Processes and Cleanliness experts and contributing to the success of new, smart space solutions.

## Major milestones of my career:

- 2008 B.Sc. Biomimetics at University of Applied Sciences Bremen
- 2010 M.Sc. Production Engineering at University Bremen
- 2015 Dr.-Ing. Production Engineering at Ceramics Bremen
- Since 2014 at OHB System AG in different roles started as Materials and Processes Engineer

9:30

**Andre Abrath**

*CEO, BREWA wte GmbH*



**My current role:** CEO at BREWA

**Describing my daily work in one sentence:** Ensure the operation of the facility and organise various teams in maintenance, planning and engineering.

**Major milestones of my career:** Vocational training as a central heating and ventilation engineer; Dipl.-Ing.

(FH) process engineering degree; Master of Business Administration degree

9:45

**Dr. Daniel Otero Baguer**

Co-founder & CEO, aisencia GmbH



**My current role:** CEO at aisencia

**Describing my daily work in one sentence:** As CEO, I drive the company's strategic vision, make critical decisions, and immerse myself in software development. I'm hands-on with AI training and data curation, ensuring our technology stays ahead of the curve.

**Major milestones of my career:** Leading aisencia to success, expanding our cutting-edge technology into numerous laboratories worldwide, and revolutionizing the way they work.

## Session 2 – Exchange with Alumni and the MAPEX Team

### 10:00 Conversation Tables

Get into direct personal exchange with the alumni speakers of the first session. Each speaker is allocated a conversation table. Choose with whom you would like to interact during this session, introduce yourself to each other, ask your questions and engage in a mutual dialogue about experiences and contacts. There will also be a table where you can have a coffee and chat to members of the MAPEX team. Multiple rounds will be held so that an exchange with several alumni is possible during this session.

## 11:00 Coffee Break

## Session 3 – Career Talks

**11:15**      **“In the end it makes all sense and is fun: my academic career between polymer electrolytes, silicon micromachining, and microbes on Mars”**

**Prof. Dr.-Ing. habil. Sven Kerzenmacher**  
*University of Bremen*

In this talk I will share my career experience and give an overview about my current research activities as a Professor in Environmental Process Engineering at the University of Bremen. Starting off with my studies in Process- and Environmental Engineering, I became fascinated with research in general and electrochemical engineering in particular during the work on my diploma thesis. After this experience my goal was clear: going for a PhD in fuel cell technology and pursue a career in research, but not necessarily academia. Having graduated from a University of Applied Sciences this career path was not straightforward, and some obstacles had to be overcome and detours were taken. On my way I worked with very different types of fuel cells, got a PhD in Microsystems Engineering, became more and more interested in biology and biotechnology, completed my habilitation, and finally became a professor in the very discipline in which I started my academic career. Today I teach Environmental Process Engineering and Biotechnology, and together with my interdisciplinary team we work towards interfacing bacteria with electrodes to enable more sustainable technologies for waste water treatment, resource recovery, and bioproduction.



**My current role:** Professor in Environmental Process Engineering at the University of Bremen.

**Describing my daily work in one sentence:** Being engaged in a diverse array of tasks that bridge science and management in collaboration with people from various backgrounds.

**Major milestones of my career:** Deciding to go for a PhD, leading my own research group already towards the end of my PhD studies, completing my habilitation, becoming a professor at the University of Bremen.

**Prof. Dr. Dorothea Brüggemann**  
City University of Applied Sciences

Tissue regeneration is a complex biological process that occurs across multiple length scales. It ranges from the molecular level of protein interactions to the cellular level where individual cells migrate, to the tissue and organ level, where the structural and functional tissue integrity is finally restored. To enable the repair of different tissue types, our research focuses on the development of new fibrous protein scaffolds tailored from the molecular level of protein fibrillogenesis *via* the nano- and microscale towards the macroscopic scaffold fabrication.

Based on fundamental biophysical principles of protein-protein interactions, we develop new biofabrication techniques to fabricate fibrous and porous protein scaffolds. We routinely use different self-assembly techniques to prepare nanofibrous scaffolds from collagen and fibrinogen with individual fiber diameters between 100 and 300 nanometers. Fiber assembly of fibrinogen is accompanied by conformational changes on the molecular level, yet without inducing any pathogenic amyloid transitions. Using various post-treatments, such as cross-linking and freeze-drying, we are able to adjust the porosity and mechanical properties of our nanofibrous protein scaffolds. In cell culture studies we found very good interaction of both collagen and fibrinogen nanofibers with fibroblasts and keratinocytes, which are important key players during wound healing. Moreover, fibrinogen nanofibers enhanced spreading of blood platelets, minimized their procoagulant activity and could prevent infiltration with *E. Coli* bacteria, which makes them highly biocompatible.

By combining fiber self-assembly and polymer molding, we were able to scale up the scaffold production and achieve overall scaffold dimensions of several centimeters. Depending on the underlying substrate, nanofibrous fibrinogen and collagen scaffolds can remain immobilized or be detached and used as free-standing scaffolds (see Fig. 1), enabling a wide range of applications in regenerative medicine.

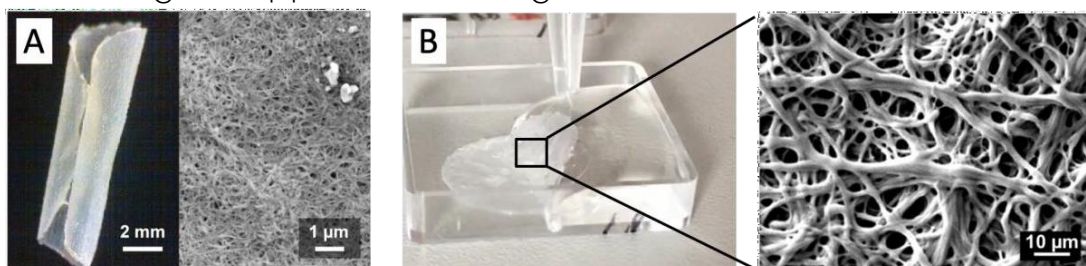


Figure 1: Self-assembled nanofiber scaffolds of (A) collagen and (B) fibrinogen were detached following cross-linking and washing (Dutta et al., 2023, Stapelfeldt et al., 2019).



**My current role:** Professor for Biophysics and Applied Biomaterials at Hochschule Bremen.

**Describing my daily work in one sentence:** A mix of teaching and student supervision in the study courses 'Electrical engineering' and 'Technical and Applied Physics' as well as research in biomaterials science besides some administrative tasks.

### Major milestones of my career:

- Physics diploma, RWTH Aachen: Organic thin films
- PhD in biophysics, FZ Jülich: Nanostructured cell electrodes
- Postdoctoral researcher, Trinity College Dublin: Single molecule mechanics
- Group leader, MPI for Intelligent Systems, Stuttgart: Synthetic cell systems
- Emmy Noether research group leader, Uni Bremen: Fiber-based protein scaffolds
- Professor, Hochschule Bremen: Biophysics and Biomaterials science

### 12:15 Discussion on academic career paths

**Prof. Dr.-Ing. habil. Sven Kerzenmacher**  
*University Bremen*

**Prof. Dr. Dorothea Brüggemann**  
*City University of Applied Sciences*

12:45 End of Workshop / Joint Lunch at  
Mensa



# MAPEX

## Doctoral Qualification Programme



In addition to their scientific education, MAPEX supports doctoral candidates in acquiring transversal skills and competencies needed for taking over leadership tasks inside or outside of academia after the successful completion of their doctorate.

The **MAPEX Doctoral Qualification Programme (MAPEX-QP)** offers the following benefits to its members:

- a **milestone-based programme** covering five qualification areas,
- a **transcript of records** summarising achieved milestones,
- a comprehensive **summary of training courses** and **workshops** offered by various institutions at the University of Bremen,
- **individual consultation** and **advice** with regard to their doctoral qualification process and the development of their personal competencies,
- **workshops** and **networking events** specifically targeted at Early Career Researchers from MAPEX disciplines,
- the access to **MAPEX funding** for research stays abroad, materials analytics and organization of scientific workshops.

### Contact and more information:



# MAPEX

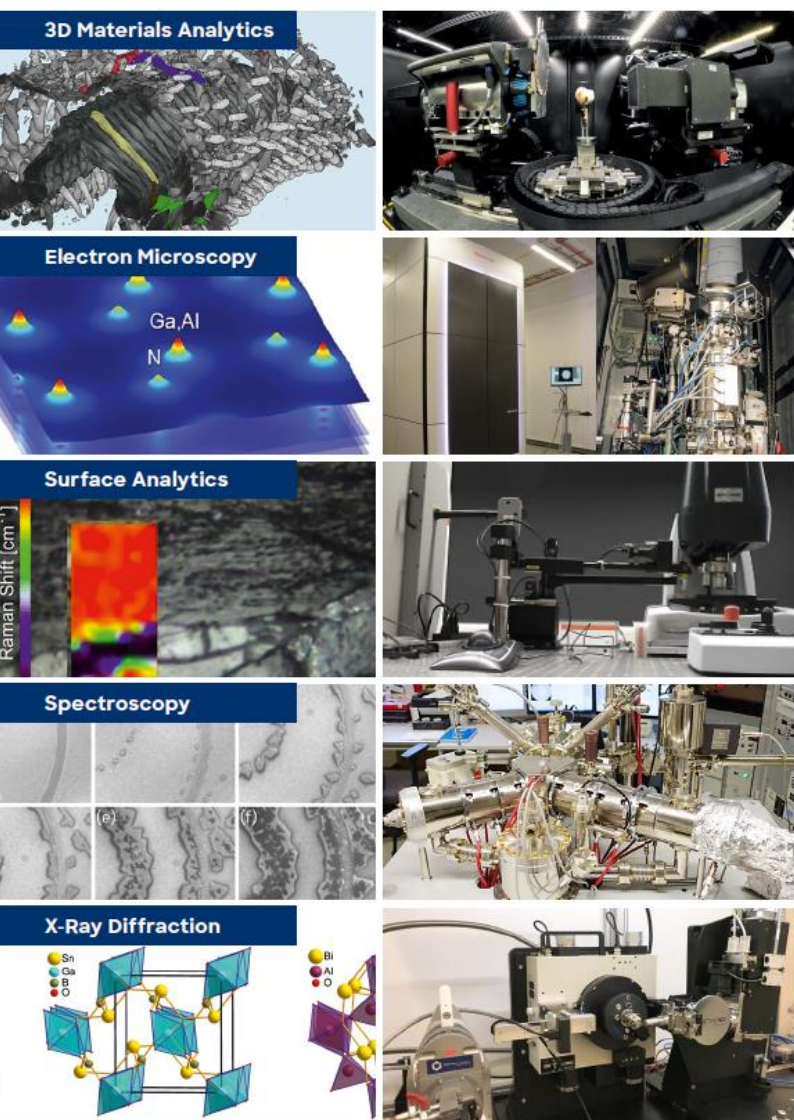
## Core Facility for Materials Analytics

A unique combination of cutting-edge instruments for the structural and chemical characterization of materials is being established within the University of Bremen by MAPEX in the form of the **MAPEX Core Facility for Materials Analytics (MAPEX-CF)**.



As a user facility, the MAPEX-CF allows scientists from several disciplines to share and access a wide range of high-performance scientific equipment in the investigation areas of **Electron Microscopy**, **3D Materials Analytics**, **Surface Analytics**, **X-ray Diffraction**, and **Spectroscopy**.

For an overview of instrumentation available in the research groups of MAPEX members, use the **Instrument Database** on the MAPEX-CF website.



We use X-rays to non-destructively inspect the three-dimensional distribution of matter inside the object of investigation.

We investigate our samples using high-energy electron beams to obtain images with resolution down to the atom scale.

We combine microscopic and spectroscopic techniques to monitor processes at materials surfaces.

We perform in-situ and real-time chemical, electronic and optical characterization of materials under different conditions, e.g. to identify and map different phases.

We support structure investigations of materials from crystalline nano-materials to macroscopic single crystals at ambient and non-ambient conditions.

# Funding

MAPEX and the MAPEX-CF supports Early Career Researchers by providing **funding** for short-term **research projects, materials analysis, workshops,** and **more.**

## Research grants for Early Career Researchers:



## Contact and more information:



MAPEX



MAPEX-CF

## 18<sup>th</sup> MAPEX Early Career Researcher Workshop

Under the motto **'Science meets Industry'** the workshop aims to give you the opportunity to interact with people who successfully made the transition from science to industry. In the lectures and various discussion formats, the MAPEX Principal Investigators and alumni of the University of Bremen will provide detailed insights into their personal career paths within and outside academia. The event will consist of talks and keynotes by MAPEX Principal Investigators and alumni of the University of Bremen, giving detailed insights about their research and personal career paths within and outside of academia. Ask questions and exchange ideas with the alumni speakers at our conversation tables. In between the sessions, there will be plenty of time to get in touch and discuss with the speakers and your ECR peers.

**University of Bremen**  
**MAPEX Center for Materials and Processes**  
[www.uni-bremen.de/mapex](http://www.uni-bremen.de/mapex)

