

Experiences and outcomes of ERASMUS+ STT

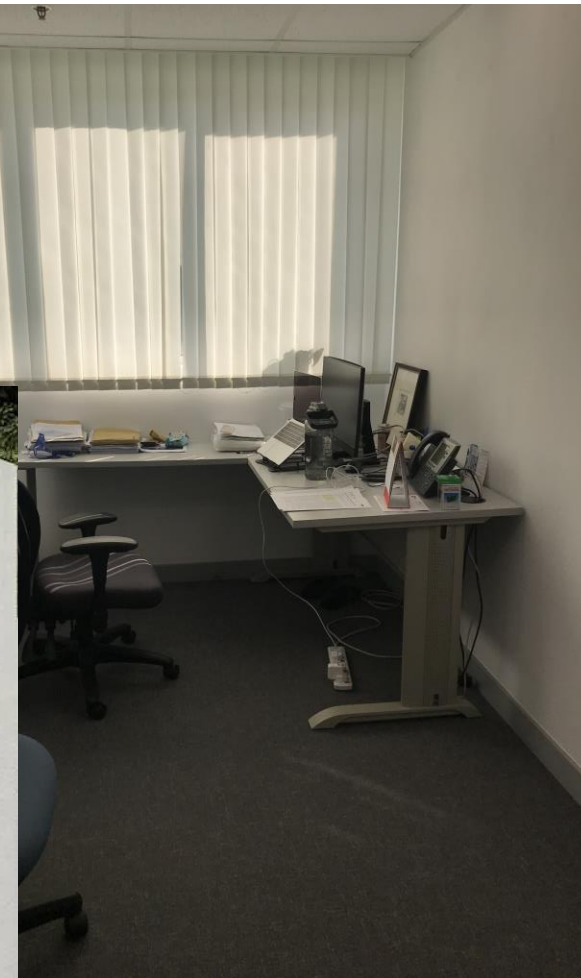
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Hong Kong – Baptist University

- Presentation
- Laboratory visit
(laboratories located in the middle of building without natural light)
- Honored professor has an office with window



呂育儒博士

Dr. Lui, Yuk Yu Matthew

Hong Kong – Baptist University – Outcome

- New cultures and
- Get insight in Asian Universities
- Teaching practices:
 - trimesters instead of semester
 - Classes between 9 a.m. – 9 p.m.
- Collaboration established between BME VBK and HKBU – published article

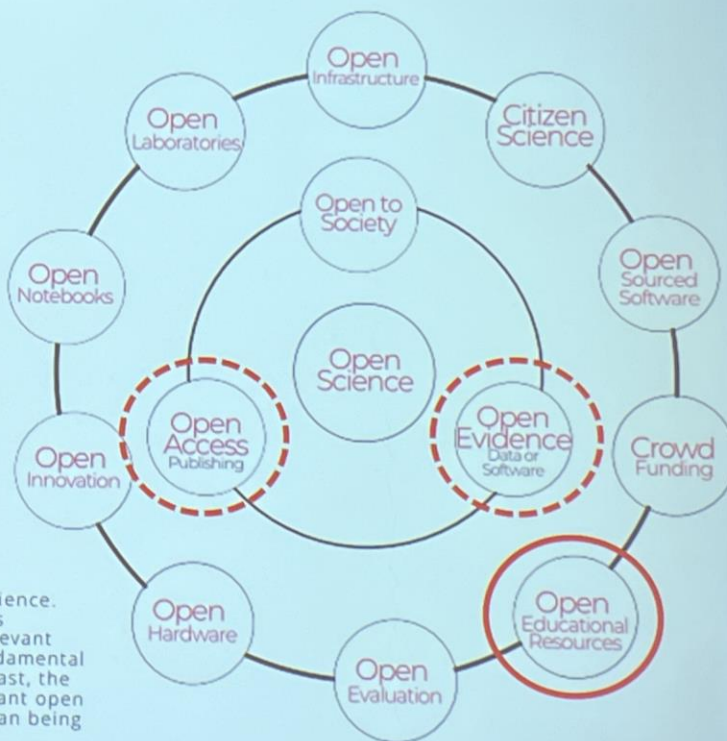


Vienna, BOKU, Research Managers forum 2025

Meeting of representatives of Eastern European Universities

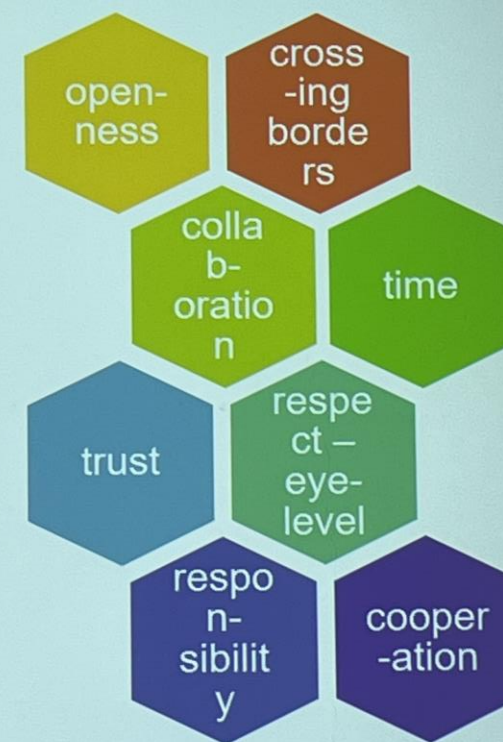
Open Science The Challenge for Universities

Figure 1. The constellation of open science. The inner orbit comprises open access publication, open evidence (data & relevant software), and open to society, as fundamental to a new era of open science. In contrast, the outer orbit includes a range of important open assets that are good to have rather than being absolutely necessary.



Open Science in

- Openness corresponds to **early knowledge and societal engagement** where appropriate.
- Recognise the diversity of research activities and **sharing and open collaboration**.
- **reward research behaviour underpinning open sharing** as well as open collaboration within science.
- **Value the skills (including open science skills),** recognise team science and collaboration.
- **Data sharing should be the minimum commitment** and data should be protected.



Research Managers Forum, March 25, 2025

Vienna – Outcomes

- * Prior the mobility: filling a Survey was required
 - in cooperation with OMIKK
- * Discussion of the survey and answers
- * Outcome: draft of Open Science Action Plan of BME

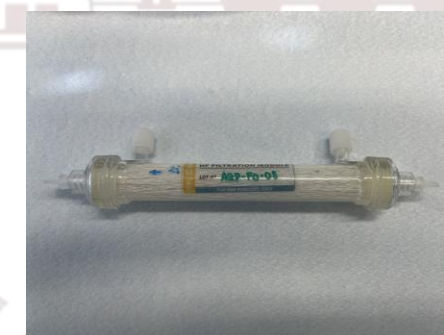


Action Plan of BME between 2025-2027

Cultural Change/Leadership | Roadmap for Successful Implementation

Title of the activity	Responsible for coordination	Description of the activity
A1: Development an Open Science Policy	Vice-Rector and	The comprehensive OS strategy and OA publication strategy which are currently under development will be finalized.
A2: Appointing a senior manager	Vice-Rector	A senior manager for OS will be identified and appointed. He or she will have clear responsibilities and competencies for developing and implementing OS policies and practices across all eight pillars.

Maribor – University of Maribor, 2025



Maribor – Outcomes

- Succesfull application, grant: **2026–2027**
2025-1.2.4-TÉT-2025-00040 “Zöld hidrogén előállítás membrános eljárásokkal”
- Common research started
- First collaborative conference participation at 12CCC, 27-30 September 2026, Budapest, MTA TTK

Removal of microplastics from power plant make-up water by single- and two-stage micro filtration with a future perspective on forward osmosis

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Abstract

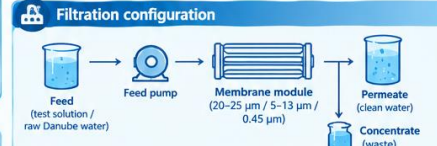
High-purity make-up water is essential for power plant operation, as strict quality requirements preserve equipment integrity, maintain thermal efficiency, and limit corrosion, scaling, fouling, and environmentally relevant discharge impacts. Among source-water contaminants, microplastics are of increasing concern because they contribute to total suspended solids (TSS) and may intensify particulate fouling. Although microplastic removal by microfiltration has been widely studied, their impact on membrane performance and possible membrane damage remains insufficiently addressed. This study evaluates microplastic removal using Filtrak 388 (20–25 µm), VWR 413 (5–13 µm), and PORAFIL MV (0.45 µm) microfiltration membranes. One-stage filtration was first performed with 20–25 µm and 5–13 µm membranes, followed by a two-stage configuration combining 5–13 µm pre-filtration with 0.45 µm polishing. The study focused on 40 µm polyamide microplastics, nylon 11 (C₁₁H₂₃NO) and nylon 12 (C₁₂H₂₅NO), using 10 mg/L model solutions, raw Danube water, and mixed Danube water-microplastic solutions. Since standardized microplastic analysis methods are still lacking, total organic carbon (TOC) was used as an indirect indicator, despite interference from natural organic matter. The 5–13 µm membrane outperformed the 20–25 µm membrane, reducing TSS by 37.96% in raw Danube water, 66.42% in the model solution, and 58.63% in the mixed solution. Two-stage microfiltration further reduced final TSS to 17.13 mg/L, <10 mg/L, and 14.4 mg/L, corresponding to total TSS rejection rates of 59.01%, 66.42%, and 64.30%. Final TOC values were 3.35 mg/L, 1.097 mg/L, and 3.10 mg/L, while water recovery remained high at 98.5–99.3%. Both membranes retained microplastics, but signs of mechanical degradation were observed.

Experimental set-up



- 1 Feed funnel (test solution / raw Danube water)
- 2 Membrane module (20–25 µm / 5–13 µm / 0.45 µm)
- 3 Permeate collection (clean water)
- 4 Concentrate (waste)

Filtration configuration



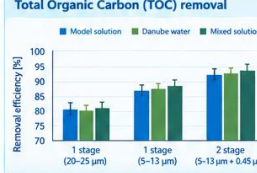
Feed (test solution / raw Danube water) → Feed pump → Membrane module (20–25 µm / 5–13 µm / 0.45 µm) → Permeate (clean water) / Concentrate (waste)

Key results

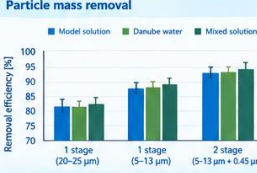
Total Suspended Solids (TSS) removal



Total Organic Carbon (TOC) removal

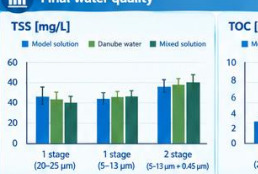


Particle mass removal

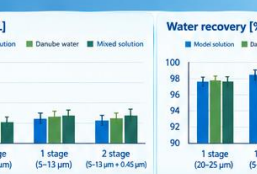


Final water quality

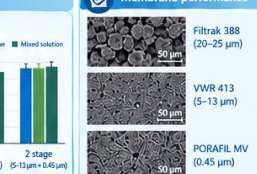
TSS [mg/L]



TOC [mg/L]



Water recovery [%]



Membrane performance



Filtrak 388 (20–25 µm)
VWR 413 (5–13 µm)
PORAFIL MV (0.45 µm)

Main findings

- 5–13 µm membrane outperformed 20–25 µm in one-stage filtration.
- Two-stage filtration (5–13 µm + 0.45 µm) achieved the highest removal efficiencies.
- Nylon 11 showed slightly better performance than Nylon 12.
- Final TSS: 17.13 mg/L (raw Danube), <10 mg/L (model), 14.4 mg/L (mixed).
- Final TOC: 3.35 mg/L (raw Danube), 1.097 mg/L (model), 3.10 mg/L (mixed).
- Water recovery: 98.5–99.3%.
- Both membranes retained microplastics, but signs of mechanical degradation were observed.

Conclusion & future work

Membrane filtration is an effective method for microplastic removal from make-up water. Further research should focus on standardized analysis methods and long-term membrane performance.

As a future perspective, forward osmosis may offer a low hydraulic-pressure route for treating microplastic-contaminated wastewater, with potential advantages in energy demand and particle rejection. Further work is needed to assess durability, scalability, and performance in real wastewater matrices.

Acknowledgement

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EELISA meeting, Istambul, 2025

- BME delegation in Istambul
- Outcome:
- Get in contact with ITÜ's open science ambassador



Bratislava – Slovak University of Technology in Bratislava, 2026

Presentation
Laboratory visit
Common topic: membrane-based research

Outcome:

- Recognition of complementary knowledge
- Started working on a review article in 2026 September

