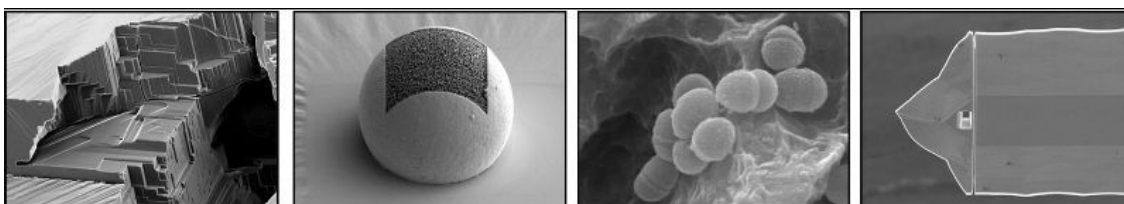


NANO IMAGING LAB

Newsletter

September 22, 2026



AFM Conference in Genoa in May 2026



The 24th International Scanning Probe Microscopy Conference (ISPM 2026) took place May 26–29, 2026, at the Palazzo della Borsa in Genoa, Italy.

The conference focused on scanning probe microscopy techniques, nanostructures, and applications in biology, medicine, and materials science.



Marcus and Monica attended the meeting and obviously they enjoyed not only the academic program but also Genoa's beautiful old town.

The scientific program highlighted recent advances and breakthrough methodologies in **AFM and STM**, covering topics such as:

- SPM on single molecules and model biological systems;
- AFM on cells and multicellular systems;
- AFM in disease-related research and mechanotransduction;
- Multifrequency AFM approaches to nanomechanics;
- Correlative SPM microscopy;
- High-speed and ultra-fast SPM;
- Nanometrology, quantum materials, and energy research;
- Nanotribology;
- Novel methodologies, including **Artificial Intelligence**.

Fruitful scientific collaboration with Karlsruhe Institute of Technology (KIT)

This spring the Nano Imaging Lab and their research partner, the Institute for Advanced Membrane Technology (IAMT) of the Karlsruhe Institute of Technology (KIT), successfully published in the Journal Water Research on the topic of Nanofiltration.

Nanofiltration is an effective barrier for removing nanoplastics (NPs) from water.

In order to reduce human exposure through contaminated water, drinking water treatment processes are employed for the removal of NPs. The application of prefilters (5 μm), Microfiltration (0.1-1 μm) or Ultrafiltration (0.01-0.1 μm) prior to Nanofiltration (10-1.0 nm) would substantially reduce the concentration of microplastics and NPs in Nanofiltration feed water. However, retained NPs may deposit and adhere onto membranes, potentially altering surface properties and performance (e.g., fouling and scaling potential).

The results obtained in this study provide critical insights into the potential application of laser-induced breakdown detection (LIBD) for investigating the fate of NPs during Nanofiltration and elucidating the deposition and release behavior of NPs under variable operating conditions.

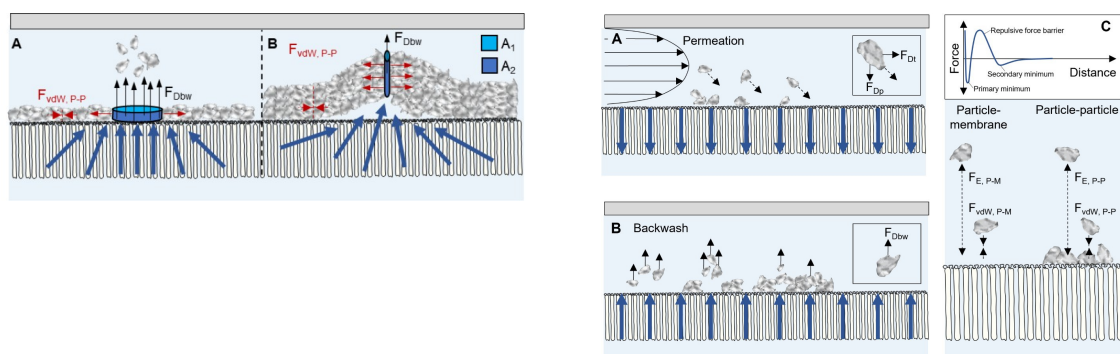


Abb1: LIBD can quantify the deposition and release of nanoparticles ($\mu\text{g/L}$) in nanofiltration.

Increasing the concentration of polystyrene (PS) particles in feed water resulted in greater

particle deposition and release during backwash. Visualization of membrane samples using SEM revealed that the release of deposited particles during backwash proceeded via two distinct mechanisms: i) complete release from small circular spots near membrane pores for thin deposits (1–3 layers of PS particles), and ii) partial release and fractured cake layers for thick deposits (4–5 layers of PS particles).

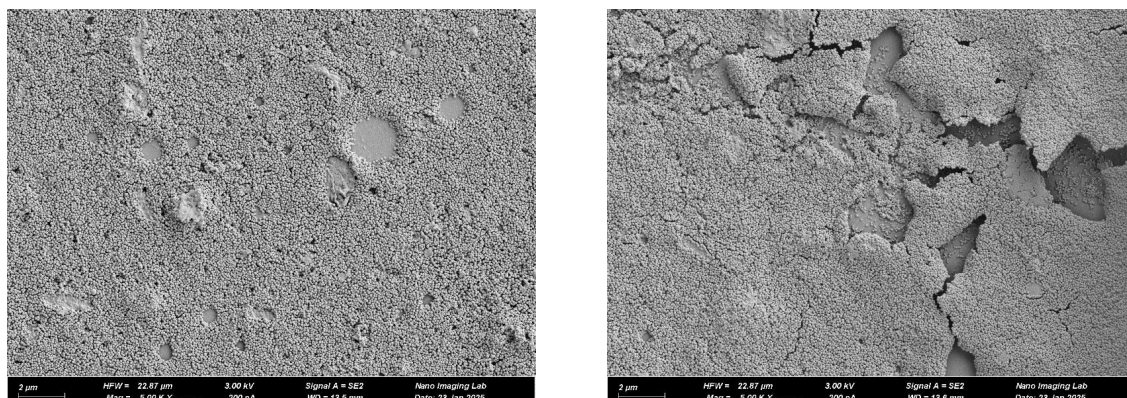


Abb2: SEM images of membranes after filtration and backwash.

This demonstrates the potential application of LIBD and SEM to support research regarding particle release mechanisms during backwash and the development of new strategies to enhance cleaning efficiency for NPs. Neither particle deposition nor release varied substantially with particle size (50–400 nm), as the applied permeate flux exceeded the estimated critical flux.

Tyler A. Malkoske, Minh N. Nguyen, **Susanne Erpel**, **Marcus Wyss**, Andrea I. Schäfer

Real-time quantification of nanoplastics deposition in nanofiltration using laser-induced breakdown detection (LIBD)

Water Research, 304, 126362 (2026)

doi.org/10.1016/j.watres.2026.126362

Group outing of NILab and NFLab to the Mont Terri Rock Laboratory



Once again the NI Lab and the NF Lab organized a corporate work outing on June 16th 2026. In order to spend an enjoyable day together that also should have some intellectual aspirations, they chose to visit the Rock Laboratory in St. Ursanne in Kanton Jura.

The Mont Terri Rock Laboratory is a research facility, studying the Opalinus Clay, which is intended to serve as the host rock for a future deep geological repository for radioactive waste.

The group was taken deep underground into the laboratory's shafts to tour the various research installations. The tour guide's explanations were extremely interesting, entertaining, and informative.



A stroll through the charming little town of St. Ursanne rounded out the program and ended with a visit to a restaurant where we enjoyed the local fish specialties.

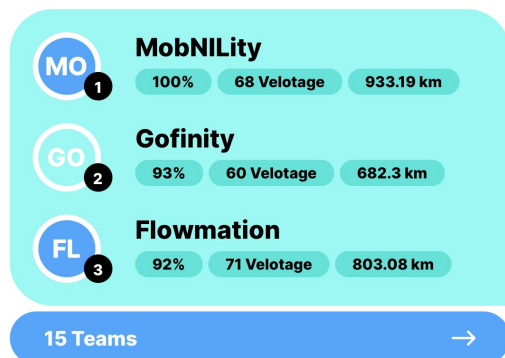


High mobility



Departement Pharmazeutische
Wissenschaften/Uni Basel

TOP 3 TEAMS



The NI Lab team not only demonstrates high mobility at work, but they also show 100 percent commitment to the environment by biking to work every day for a whole month and this despite the fact that some of the commutes are quite long, as is clearly evident from the high mileage!

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