

Masters Project (6 months)

Micropollutant uptake and release by micro- and nanoplastics

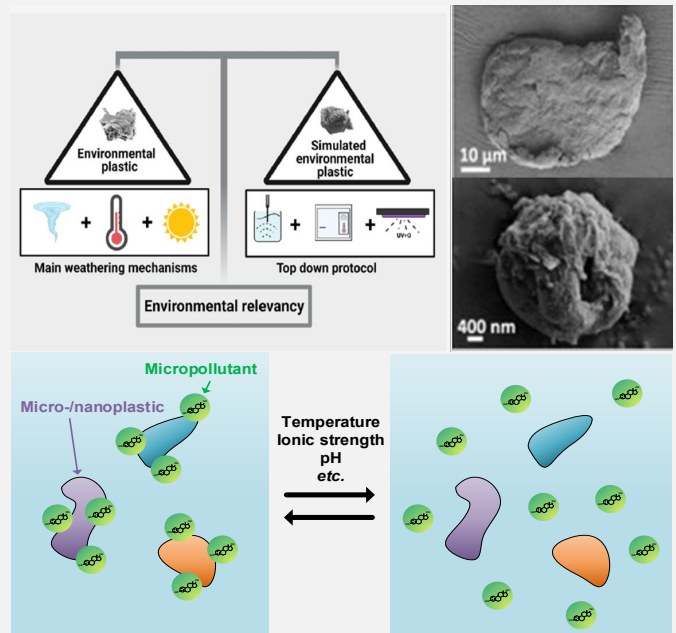
Project summary

Microplastics and nanoplastics are ubiquitously found in the water environment and have recently gained tremendous concerns over their toxicity. The presence of these materials affect the transport of pollutants and micropollutants (MPs) in the water environment. Since micro- and nanoplastics can be retained by ultra- and nanofiltration membranes, MPs that are partitioned to these materials can be co-retained. This Masters project specifically aims to investigate the weak supramolecular interactions between micro-/nanoplastics and steroid hormone MPs and elucidate the uptake/release mechanisms of these MPs. The project will include;

- (at TAU, Israel) characterise micro- and nanoplastics with varied origins, sizes, and surface properties following standard fabrication processes,
- (at KIT-IAMT) carry out MP adsorption experiments, determine MP concentrations and partitioning through mass balance, and
- participate in discussions within this German-Israeli collaboration.

Specific project tasks are;

- ◆ Review literature on the topics of micro- and nanoplastics contamination, MPs, adsorption (uptake), desorption (release), membrane filtration, *etc.*,
- ◆ Fabricate and characterize the size, surface morphology and surface chemical composition of the micro- and nanoplastics with available tools at TAU,
- ◆ Operate static adsorption experiments and determination of MP concentrations with already established analytical tools at IAMT to evaluate the partitioning,
- ◆ Analyse experimental data and contribute to write a joint research publication (in English).



Qualifications

The project is the final research project in a Masters degree. The candidate will be studying for a Masters in Chemical, Process, Environmental Engineering, or equivalent and is a naturally curious person who is eager to learn more and has a strong interest in research. Basic knowledge in water chemistry, water treatment process, membrane technology is essential. Evidenced writing skills in English language, ability to learn/use Origin Labs software for data analysis and graphing and Endnote for literature management, willingness to lead or contribute to the writing of a scientific publication.

KIT/TAU

The project can be hosted by TAU and/or KIT-IAMT. Interested candidates will be considered for continuation in PhD at either institution. KIT is one of the biggest research institutions worldwide and has access to state-of-the-art research facilities as the research University of the Helmholtz Association. Tel Aviv University is a public research university in Tel Aviv, Israel. With over 30,000 students, it is the largest university in the country, also ranked 7th worldwide for graduating the most start-up founders!

Contact

Prof. Dr.-Ing. Andrea I. Schäfer, Institute for Advanced Membrane Technology (IAMT), +49(0)721 608 26906, Andrea.Iris.Schaefer@kit.edu, <https://www.iamt.kit.edu>.

Prof. Ines Zucker, School of Mechanical Engineering and Porter School of the Environment and Earth Sciences, Tel Aviv University, +972 03-6408227, ineszucker@tauex.tau.ac.il

Applications

Please send applications with CV, publication list and your contribution to the publication (if relevant), academic transcripts, degree certificates, contact details for references to the above contact(s). A valid driver's licence will be required. Funding for a stay abroad can be requested through the BMBF Young Scientists Program.