

Researchers reveal microscopic polymers polluting Adelaide's waterways



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The discovery that Adelaide's freshwater streams are contributing to the transport of microplastics into South Australia's precious coastal marine habitats has motivated Flinders University researchers to gather new knowledge about microplastic pollution.

Led by Professor Sophie Leterme and Dr Anastasiia Snigirova, the researchers are assessing the distribution of microplastics across Gulf Saint Vincent at potential hot-spots and classifying the polymer type of each microplastic using Raman spectroscopy to categorise the origin of the fragment.

"We are very excited to demonstrate which polymers prevail in the marine and freshwater environment as a part of microplastic contamination," said Dr Snigirova. "We believe this information will trigger the creation of new environmentally friendly polymer innovations and technologies for everyday usage."

Using a Raman microscope provided by the South Australian node of the Australian National Fabrication Facility (ANFF-SA), the researchers are identifying the molecular composition of microplastic particles including polyester, polyethylene, polycarbonate, polystyrene, and polypropylene.

Dr Snigirova says open access to ANFF-SA's characterisation equipment

is helping them to fill gaps in traditional methodological approaches to microplastic studies as the coloured particles have interfered with the polymer identification process.

"ANFF-SA's Raman microscope has enabled us to identify and compile a list of polymers found in the freshwater streams of the Adelaide region," Prof Sophie Leterme.

"With easy access to ANFF-SA's Raman spectrometry equipment and their spectral analysis expert, Dr Jason Gascooke, we are optimising novel methods and protocols to develop a balanced and comprehensive methodology for microplastic studies," said Dr Snigirova.

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Professor Sophie Leterme, Flinders University. ”

"We hope this critical research will provide a basis for future plastic waste management policy and strategies in the area."

Professor Leterme says ANFF-SA is essential to the continuation of the team's microplastic research and, together with Dr Gascooke, they have integrated ANFF-SA's capabilities and expertise into the Flinders University teaching program.

"Incorporating ANFF-SA into our undergraduate teaching laboratories has already provided 60 students with

critical knowledge about contemporary methods in microplastic sampling and identification," said Prof Leterme. "The Raman spectroscopy microscope offers the students another cutting-edge tool to help progress their careers."

Prof Leterme, Dr Snigirova and Dr Gascooke have secured ongoing project collaborations including research projects for undergrads, honours, postgraduate and postdoctoral students and they are now seeking future grants to continue their innovative partnership.

Co-located at Flinders University and the University of South Australia's Mawson Lakes campus, ANFF-SA is a world-class micro and nanofabrication

facility providing access to cutting-edge equipment and facilities with support from expert staff.

Specialising in microfluidics, organic electronics, biomaterials, novel semiconductor materials and characterisation, ANFF-SA can support or undertake research and development of your next project.

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Dr Snigirova and Dr Gascooke taking water samples in Gulf Saint Vincent.

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