TRENT UNIVERSITY

CHEMISTRY/PHYSICS SEMINAR SERIES

Dr. François Perreault

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Wednesday, November 18, 2026

11:00 a.m. to 11:50 a.m. in ENW 115

Microplastic models for environmental studies: importance of the weathering conditions and plastic composition

ABSTRACT

In the environment, plastics undergo fragmentation into micro- and nanoplastics (MNPs) under the action of ultraviolet (UV) light, mechanical abrasion, or chemical reactions. Surface weathering during MNPs formation introduce functional groups to the surface and affect their interactions with contaminants. To produce environmentally relevant MNPs in the laboratory, researchers have often altered MNPs in an accelerated manner to produce quickly the relevant masses needed for experimental work. However, these MNPs may not realistically represent the morphology, size distribution, and surface chemistry of environmental MNPs. This seminar will discuss how the different approached we use to rapidly produce aged MNPs may affect the behavior of these MP models in environmental studies. We show that different weathering procedures results in microplastics that presents different morphology and surface chemistry, and that these differences alter how the MNPs interact with environmental contaminants. We also discuss the importance of the weathering matrix on the different MNPs properties relevant for their environmental fate. Finally, we show that the composition of MNPs, particularly the presence of additives, may significantly alter their environmental behavior. All these parameters are often overlooked when selection MP models for laboratory conditions; however, depending on the contaminant, the weathering procedure, or the MNPs selection, this may lead to an inaccurate prediction of the environmental fate of MPs in aquatic environments.

BIOGRAPHY

François Perreault is Associate Professor in the Department of Chemistry of the University of Quebec in Montreal (UQAM). He completed his Ph.D. in Environmental Sciences at UQAM and was a NSERC postdoctoral fellow in the Department of Chemical and Environmental Engineering at Yale University before starting his independent career at Arizona State University, where he was an Assistant and then Associate Professor of environmental engineering in the School of Sustainable Engineering and the Built Environment. His research was recognized by the Emerging Investigator Award of the Sustainable Nanotechnology Organization, the Excellence in Research award of the NanoQAM center and the Faculty of Sciences of UQAM, and twice by the Quentin Mees Research Award from the Arizona Water Association. His work explores the interface between materials and biological systems, with a focus on nanotechnology, microplastics, and membrane separation. He currently serves as a Thrust Leader for the Water Resources Thrust of the Global HyPT center on green hydrogen production technology and is an Associate Editor of the journal Aquatic Toxicology.