CHEMISTRY/PHYSICS SEMINAR SERIES


# Dr. Sarah Styler

## Assistant Professor, Environmental Chemistry and Tier 2 Canada Research Chair in Atmospheric Chemistry, McMaster University


**Wednesday, October 1st, 2025**

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

## ‘Stories from the city, stories from the sea’ —exploring chemistry at anthropogenic interfaces


**ABSTRACT**

“The unifying and distinguishing characteristic of this [modern] era has been the human pre-emption and discovery of the biosphere. This is a simple way of stating a complex paradox: the biosphere was occupied and its exploitation well advanced before its true nature—vulnerable and finite—was even vaguely perceived.” Lynton Caldwell, reproduced in a course pack for ‘The Study of Environment’ (JIE 222Y), University of Toronto, 2003–2004.

In 2004, the year that I turned twenty-one, my JIE 222 professor told me that atmospheric CO2 levels would eventually reach 400 ppm; in 2024, the NOAA Global Monitoring Laboratory and Wikipedia told me that the monthly mean levels measured at the Mauna Loa observatory in Hawai‘i passed 426 ppm for the first time since ground sloths and mastodons navigated the cooling Pliocene climate. In 2004, I spent a lot of time listening to ‘Cuyahoga’, an REM song in part about Ohio’s Cuyahoga River, the literal burning of which catalyzed the passage of the Clean Water Act; now, I spend time reading about microplastics in Arctic ecosystems, in human brains. I feel strangely nostalgic for the environmental problems of my childhood (acid rain, chlorofluorocarbons, littering), which were much less insidious and much more amenable to focused mitigation strategies than those we face today. In the absence of ‘easy’ problems to solve, and knowing that scientific consensus is a necessary but insufficient condition for substantive progress in addressing complex challenges, I often think about what might constitute a meaningful career in environmental chemistry. Currently, my team’s research priorities are guided by two basic questions: “Is this interesting?” and “Is this important?” In this talk, I will share my team’s latest answers to three questions—all interesting, at least one important—related to chemistry at anthropogenic (derived from human activities) interfaces:

How dirty do building surfaces get as a result of exposure to wildfire smoke?

What is the environmental fate of microplastic-associated organic pollutants?

Can we work with community partners in Hamilton (nickname: “Steeltown”) to develop a high-spatial-resolution picture of dustfall quantity and composition across the city?


**BIOGRAPHY**

**Sarah Styler**

Sarah A. Styler obtained her BSc, MSc, and PhD from the University of Toronto and conducted postdoctoral research at the Leibniz Institute for Tropospheric Research in Leipzig, Germany. In 2015, she joined the University of Alberta as an Assistant Professor of Environmental Chemistry; in Summer 2020, she moved east to McMaster University, where she is currently an Assistant Professor of Environmental Chemistry and Tier 2 Canada Research Chair in Atmospheric Chemistry.