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Mar 4th, 3:45 PM - 5:00 PM

Fluorine beyond PFAS: Tracking fluorine during photolysis of fluorinated pesticides and pharmaceuticals

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The Doctoral Program in Environmental Science & Management
and MSU Sustainability Seminar Series Present:

Fluorine beyond PFAS: Tracking fluorine during photolysis of
fluorinated pesticides and pharmaceuticals

WHEN: March 4, 3:45 pm WHERE: CELS 120 lecture hall

Dr. William Arnold

Distinguished McKnight University and Joseph T. and Rose S. Ling Professor
University of Minnesota - Twin Cities



William Arnold's research focuses on the fate of organic chemicals in natural and engineered aquatic systems. He received his B.S. in Chemical Engineering from MIT (1994), M.S. in Chemical Engineering from Yale (1995) and Ph.D. in Environmental Engineering from Johns Hopkins (1999). He then joined the U of MN faculty. For the 2023-2024 academic year, he is a Distinguished Teaching Professor at Princeton University. He has won both the AEESP Frontiers in Research Award and Outstanding Publication Award, and he was named as a 2023 Distinguished Engineer of the Year by the Minnesota Federation of Eng., Science, and Technology Societies.

Fluorine incorporation into organic chemicals is ubiquitous. There are many mass-produced chemicals, including pharmaceuticals, pesticides, and medical contrast agents, containing one or more fluorine atoms that are released into the environment. Upon photolysis or oxidative treatment in aquatic systems, persistent fluorinated byproducts or fluoride from pesticides and pharmaceuticals are formed depending on the type and stability of the fluorine-containing functional group. Byproduct quantification was performed using ^{19}F -NMR and high-resolution mass spectrometry. Some motifs are persistent, generating new PFAS, while others degrade to fluoride. These results will assist in the future optimization of water treatment methods and development of pharmaceutical/pesticide structures to reduce persistent byproduct formation.

For more information please contact Dr. Yang Deng at dengy@montclair.edu