MEMORIAL UNIVERSITY

Dr. Etienne LaPierre

Department of Chemistry, University of Victoria, BC

Thursday, October 9, 2025 at 1:00pm (Rm: CSF-1302)

Putting the PN in Pnictogen: Halophosphazenes as Precursors to Low-Valent Binary Phosphorus-Nitrogen Compounds and Polymers

Abstract:

Formally zero-valent binary PN is one of the most prevalent phosphorus containing species present in interstellar media. The chemistry of this moiety may glean important information regarding the genesis of biologically relevant phosphorus species, while higher binary PN compounds such as cyclo-triphosphazene, $(PN)_3$, or polymeric phosphorus nitride $(PN)_n$ are of interest as wholly-inorganic analogues of fundamental organic molecules and materials. Unfortunately, synthetic methods to access these species are extremely limited, and condensed phase synthesis of the latter two are still unrealized. One hitherto unexplored methodology to access low-valent PN complexes is by reduction of high-valent (P(V)) chlorophosphazenes, a well-explored and diverse class of compounds owing to their importance in the synthesis of *poly*-phosphazenes. This talk will present advances in this strategy, detailing successes in accessing conjugated short binary phosphorus nitrogen chains and heterocycles, and culminating in the synthesis of polymers containing reduced PN fragments, demonstrating the extension of fundamental molecular chemistry to applied polymer synthesis.

Biography:

Etienne was born and raised in Langley, BC, a suburb of Vancouver. He completed his BSc degree at the University of British Columbia in 2013, where he carried out research with Prof. Mike Fryzuk. He then moved to the University of Calgary to pursue his PhD research on organo-transition metal chemistry under the supervision of Prof. Warren Piers, completing his degree in 2018. He then joined the group of the late Prof. Ian Manners upon his move to the University of Victoria in 2019 as a post-doctoral fellow, where he took on diverse projects spanning catalysis, polymer synthesis, lithography, and fundamental structure and bonding. He remained in this position until December 2023, after which he assumed responsibility for the operation of Manners group as an adjunct assistant professor. Outside the lab Etienne enjoys his cat, Nickel, video games and lifting heavy things, while his pet peeves include slow walkers and the hidden curriculum.