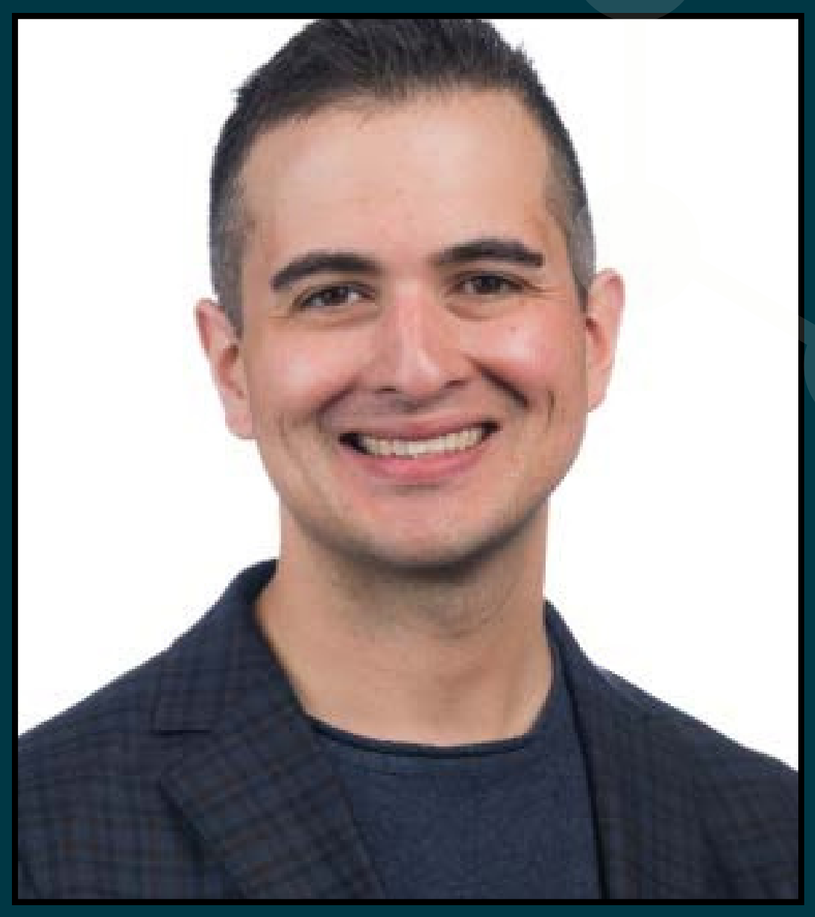
Chemical & Physical Sciences
UNIVERSITY OF TORONTO
MISSISSAUGA

Colloquium Seminar Series
Wednesday, December 4, 2024
3:15PM in CC3150



FEATURING
MARCUS DROVER, PHD
Assistant Professor, Chemistry
Western Univeristy

EXTERIOR DECORATING: HARNESSING NON-COVALENT INTERACTIONS FOR COOPERATIVE CHEMISTRY

Ligand design is a cornerstone of synthetic chemistry, offering stability to elements spanning the periodic table, permitting control of reactivity and/or selectivity. In my research group, we design, prepare, and test new hybrid ligands that contain multifunctional coordination spheres, studying interactions with transition metal and main group compounds alike. We are motivated by a desire to revise the way in which humans interact with the planet by providing better methods for the synthesis of specialty chemicals and inventing new ways to utilize greenhouse gases as chemical feedstocks. While studies that examine primary coordination sphere ligand effects on reactivity are well-documented, those studying secondary coordination effects are comparatively rarer. This lecture will address fundamental questions that deepen our understanding of secondary coordination sphere effects on carbon dioxide (CO2) reduction using derivatized metal hydride analogues of the type, [Cp*Fe(diphosphine)H] (Cp* = C5Me5 -) – a well-studied family of organometallic complex – as models. More precisely, the general reactivity of [(Cp*-BR2)Fe(diphosphine)H], which contains an intramolecularly positioned Lewis-acid, and its cooperative reactivity with CO2 will be described. These findings provide valuable insights into metal-ligand cooperative design strategies for carbonyl reduction and illustrate the versatility of intramolecularly positioned Lewis acids for otherwise challenging chemical transformations.