

# ASHLEE J. HOWARTH

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Thursday, April 2nd

4:00 PM – 5:00 PM

Steele 315

## “Exploring the Complex Structural Landscape and Potential Applications of Rare-Earth Metal–Organic Frameworks”

**Abstract:** Metal–organic frameworks (MOFs) are structurally diverse, porous materials comprised of metal nodes bridged by organic linkers. Through careful choice of nodes and linkers, the chemical and physical properties of MOFs can be elegantly tuned and materials with very high surface area and porosity can be obtained. As a consequence, MOFs have been explored for many potential applications including, but not limited to, gas storage and release, chemical separations, catalysis, drug delivery, light harvesting and energy conversion, and the detoxification of hazardous analytes. In addition to these promising potential applications, MOFs offer an interesting platform for studying fundamental concepts in inorganic materials chemistry. In the Howarth lab, we are interested in the design and synthesis of novel MOFs comprised of rare-earth (RE) ions. RE ions, which include Y(III), Sc(III), and the series of fifteen lanthanoids (Ln(III)) have high and variable coordination numbers and allow for the construction of unique and intricate MOF topologies. Furthermore, RE-MOFs can be produced with diverse optical and electronic properties dictated by the  $4f$  electron configurations of the RE ion. In this presentation, RE-MOFs are explored from design.

**Bio:** Ashlee J. Howarth is an Associate Professor and Concordia University Research Chair at Concordia University in Montréal. She was born and raised in London, Ontario. She obtained her undergraduate degree from the University of Western Ontario in 2009 and then went on to do her PhD in inorganic materials chemistry at the University of British Columbia under the supervision of Michael O. Wolf. Before joining the faculty at Concordia, she completed an NSERC Postdoctoral Fellowship at Northwestern University with Joseph T. Hupp and Omar K. Farha. At Concordia, the Howarth group is focused on the design and synthesis of rare-earth cluster-based metal–organic frameworks targeting applications in pollution remediation, catalysis, drug delivery, X-ray detection, and chemical sensing.