

Meet Prof. C. Michael McGuirk, Thieme Chemistry Journals Awardee 2024!



Prof. C. Michael McGuirk is an Assistant Professor in the Department of Chemistry, Colorado School of Mines (USA). He obtained his PhD from Northwestern University (USA) in 2016 and spent three years as a Philomathia Postdoctoral Fellow at the University of California–Berkeley (USA) prior to starting his independent career.

Thieme: Which field of organic chemistry are you interested in the most and why?

Prof. McGuirk: Supramolecular materials, specifically functional materials that can be assembled through noncovalent interactions programmed into the structure and composition of organic molecules. I am fascinated by thinking not only about the individual molecule, but how we can design molecules to programmably interact with themselves or others, leading to spontaneous assembly of something functional from simple building blocks.

Thieme: Following that, what is the focus of your current research activity?

Prof. McGuirk: In the realm of organic materials, my lab is focused on the assembly of porous materials through sigma-hole bonding interactions, namely halogen bonding and chalcogen bonding. We are asking the question of whether these more recently recognized noncovalent interactions can be intuitively used to both assemble and stabilize porous materials, towards new generations of functional materials.

Thieme: What do you think about the modern role and prospects of organic chemistry?

Prof. McGuirk: I believe that organic chemistry will serve a central role in our ongoing efforts to mitigate the effects of human-caused climate change and pollution, namely in the development of new functional materials. From charge storage to carbon capture, a rigorous understanding of organic chemistry is central to the intuitive development of materials with the very specific needed behaviors necessary to enable the requisite technologies of both now and the future.

Thieme: Which difficulties are there for young upcoming chemists in your field? Do you have any tips?

Prof. McGuirk: I think one of the primary challenges is working towards achieving expertise in a specific discipline while also not pigeon-holing oneself, given that the scientific community is becoming ever more collaborative and the lines between most disciplines are blurred, if not entirely gone. While we must still push ourselves to be rigorous in our own discipline, we must also try to be cognizant of the scientific world around us. In my opinion, the easiest way to do this is attending seminars in other disciplines of chemistry and other fields of science and engineering.

Thieme: What is your most important scientific achievement to date and why?

Prof. McGuirk: I feel that my lab's upcoming work (unpublished at time of writing) on chalcogen-bonded organic frameworks, led by Dr. Brian Eckstein, represents the biggest breakthrough that I have been a part of. We believe that this work not only represents the first demonstration of a whole new class of functional materials, but will also serve to change how people in the community think about sigma-hole bonding interactions, particularly in comparison to hydrogen bonding.

Thieme: Could you tell us something about yourself outside the lab, such as your hobbies or extra-work interests?

Prof. McGuirk: Since moving to Colorado, I have become obsessed with skiing. Excitingly, my children are now old enough to learn, so we spend lots of time in the mountains teaching them and having fun in the snow.