



**Ming-Yu Ngai, Ph.D.**  
**Associate Professor**  
Department of Chemistry  
Stony Brook University

## **Excited-State Catalysis in Organic Synthesis**

### **ABSTRACT:**

Our research program aims to develop new catalytic technologies for the rapid synthesis and late-stage functionalization of biorelevant molecules. Our research efforts have been directed to exploit visible-light-induced excited-state catalysis, a process that involves at least one photoexcited catalytic species, to address unmet challenges in organic synthesis. Excited-state catalysis involves the photoexcitation of catalytic organic or organometallic compounds that allows access to their excited-state landscapes for the development of previously elusive synthetic transformations. This seminar will cover our efforts in the development of (i) trifluoromethoxylating and difluoromethoxylating reagents that enables direct C-H tri- and difluoromethoxylation of aromatic compounds under mild conditions and (ii) C-2 selective functionalization of carbohydrates. Since fluorinated compounds and functionalized sugars are ubiquitous in natural products, therapeutics, imaging agents, fine chemicals, and biomaterials, I hope that our chemistry will allow convenient access to and the studies of numerous new functional molecules to aid the discovery and development of new drugs, agrochemicals, bio-probes, and polymers.

### **BIO:**

Ming was born in China and grew up in Hong Kong. He graduated from the University of Hong Kong in 2003 and earned his Ph.D. degree under the guidance of Professor Michael Krische at the University of Texas at Austin in 2008. He then continued his training as a Croucher Postdoctoral Fellow at Stanford University with Professor Barry Trost and Harvard University with Professor Tobias Ritter.

Ming joined the Chemistry Department at the State University of New York - Stony Brook in 2013. His research group focuses on developing excited-state catalysis to address unmet challenges in fluorine, carbohydrate, and carbonyl chemistry. His research programs have been supported and recognized with an NIH Maximizing Investigator Research Award, NSF CAREER Award, and ACS Young Academic Investigator. He has also recently been inducted as a member of the National Academy of Inventor.