



# 2018–2019 POCC Lecture Series

February 28, 2019, 7:30 PM

6:30 reception in the Nobel Hall

*Sponsored by Penn Chemistry*

**Prof. Alison J. Frontier**

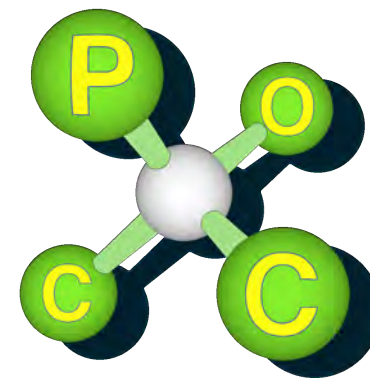
University of Rochester

## *Stereocontrolled Cationic Cyclizations for Building Complex Molecules*

Carolyn Hoff Lynch Lecture Hall

Chemistry Building, University of Pennsylvania

The Philadelphia  
Organic Chemist's  
Club



POCClub.org

Professor Frontier grew up in suburban Detroit, and received her AB from Harvard in 1992, where she did undergraduate research with Prof. Yishito Kishi. She spent two years at the Merck Research Laboratories (Rahway), and then earned her PhD in 1999 with Sam Danishefsky (Columbia University). After postdoctoral work with Barry Trost (Stanford University), in 2002 she accepted a faculty position at the University of Rochester. Her research is motivated by challenges in the synthesis of natural products, with a focus on the development of pericyclic reactions and multistep cationic cyclization cascades.

**Abstract:** The development of new cyclization strategies for rapid assembly of complex molecules from simple precursors will be described. These strategies have arisen from our work on the stereospecific Nazarov electrocyclicization, a multistep cationic process that most commonly affords cyclopentenone products. Depending upon how the Nazarov pentadienyl and cyclic allyl cationic intermediates **1** and **2** are designed, different reaction pathways can be favored and disfavored, enabling the stereocontrolled synthesis of a variety of different cyclopentanoid derivatives. An expedient strategy for generating intermediates of type **1** (X= halide) from readily available reactants, obviating the use of the typical divinyl ketone precursor, will be presented. Reaction cascades predicated on this new “halo-Nazarov” cyclization will be presented, as part of a general approach to constructing densely functionalized molecules that we refer to as a “carbonyl pinch” strategy. New examples of noncanonical, regio- and stereocontrolled cation- $\pi$  cyclizations of alkylidene  $\beta$ -ketoesters will also be presented.

