



**Joint Seminar Series of the
CENTRE FOR RESEARCH IN MOLECULAR MODELING
and the
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY**

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**Molecular beam studies of
complex interfacial kinetics and dynamics on ices**

Prof. Patrick Ayotte

Département de Chimie, Université de Sherbrooke

Ice surfaces play a commanding role in atmospheric and interstellar chemistry. For example, it is well known that the snowpack and polar stratospheric cloud particles participate in the formation of ozone consuming compounds in the Earth's atmosphere. We use a combination of molecular beam and thermal desorption mass spectrometry techniques with in situ vibrational spectroscopy to quantify the complex coupled kinetics for adsorption-desorption-diffusion-phase separation and crystallization within and on the surface of thin ice films. We will present studies of two idealized model systems for which quantitative evaluations of elementary processes have yielded insight in the rich and complex behaviour of mixed and impure ices and introduce our recent progress towards more complex and atmospherically relevant systems.

Pat Ayotte first got interested in molecular physics and molecules in strong laser fields during his undergraduate studies at Université Laval (BSc, Physique, 1993). He began his graduate career studying slow electrons interactions in the condensed phase with Prof. Léon Sanche at Université de Sherbrooke (MSc, Radiobiologie, 1995). He then moved on to Yale Chemistry to perform spectroscopic studies of mass-selected cluster anions with Prof. Mark Johnson (PhD, Chemistry, 1999). As a NSERC postdoctoral fellow, he worked on interfacial kinetics and dynamics with Dr. Bruce Kay at the WR Wiley Environmental Molecular Sciences Laboratory of Pacific Northwest National Laboratory. He joined the Faculty at the Département de Chimie de l'Université de Sherbrooke in 2002. His work encompasses various aspects of environmental molecular sciences with a distinct emphasis on ice chemistry and physics.

