# ACMS Applied Math Seminar

## Frederic Paquin-Lefebvre
Tuesday, August 28, 2018
154 Hurley Hall
3:30 – 4:30 PM

## Pattern Formation and Oscillatory Dynamics In A Coupled Bulk-Surface Reaction-Diffusion System

In this talk, a class of coupled bulk-surface reaction-diffusion models is considered. Passive diffusion occurs in the interior bulk domain and on its boundary, whereas nonlinear reaction kinetics are restricted to the later one. For the circular bulk case, we present how to systematically derive normal forms near the onset of oscillatory and symmetry-breaking instabilities. The theory is illustrated using classical Schnakenberg and Brusselator reaction kinetics, and good agreement between numerical and analytical solutions is obtained in the weakly nonlinear regime. Since our analysis is motivated by applications in cell biology, the extension of it to the study of spatio-temporal protein oscillations will be broached.

This is a joint work with Michael Ward and Wayne Nagata, UBC.