

---

**DAVE AMUNDSEN**, Carleton University

*Symmetry breaking and pattern formation in a model for neural development*

At a cellular level, the development of the nervous system and in particular axons, neurons and neuroblastoma cells is governed by a complex chemical and biological mechanism. A well-known model for this mechanism involves what are understood to be the key elements in this process, called Retinoic Acid and Notch. The model seeks to capture their feedback and interaction both inside and outside the cell. Communication across the cell membrane is achieved via so-called signaling pathways which are assumed independent. However while the model has proven consistent in a number of respects, recent evidence suggests that in fact the signaling pathways may interact with one another. The present study seeks to model and investigate the impact of this interaction in terms of the underlying mechanisms for symmetry breaking and pattern formation. Generalizations to a wider class of Reaction Diffusion equations will be discussed and numerical examples presented.

This is joint work with Majid Bani.