

# Department of Mathematics, Statistics and Computer Science



St. Francis Xavier University



presents

## A Model for Schooling Formations - An Example of Self-Organization

by

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The cohesive movement of a biological population is a commonly observed phenomenon. Particularly striking examples include schooling fishes and flocking birds. Often, individuals in such a group can only communicate locally ( i.e., with nearest neighbours), yet the aggregate maintains some global pattern, indicating that the group exhibits self-organization. With specific motivation from observed formations in Atlantic bluefin tuna and basking sharks, a simple interacting self-propelled particle model is used to study some idealized schooling formations, whose regular geometry allows some analytical insights.

In this talk, I will broadly discuss self-organization in biological systems, and then introduce the mathematical model in this context. Some analytical results (existence/stability) will be discussed and some numerical simulations of the model will be shown.

**Coffee and Donuts will be served before the talk in AX24A**