

*Workshop Nonlocal Toletum 2022: New Insights on Partial
Differential Equations and Optimization*

Alethea B. T. Barbaro

Universidad Tecnológica de Delft

Title: A model for territorial development

Abstract: Many species form territories, with individuals or groups marking these territories either chemically or visually. In this talk, we present an agent-based lattice model for territorial development. We show that our microscopic model undergoes a phase transition between well-mixed collective dynamics and territorial formation as parameters are varied. We discuss the derivation of an associated system of coupled cross-diffusion equations. The continuum system, while interesting in its own right, also gives us insight into the behavior of the lattice model.