The Department of Mathematics and Statistics of Villanova University presents a colloquium by

Dr. Rebecca Everett

Haverford College

Agent-based and continuous models of hopper bands for the Australian plague locust

Wednesday, October 21, 2020

Zoom: https://villanova.zoom.us/j/98154128846

4:00 pm

Locusts gather in large numbers to feed on crops, destroying agricultural fields. Wingless juveniles marching together through a field demonstrate collective behavior that forms a coherent front of advancing insects. We examine this front through two models: an agent-based model and a set of partial differential equations. We construct the agent-based model using observations of individual behavior from the biological literature. The PDE model yields insight into collective behavior of the front. We demonstrate that resource-dependent behavior can explain the density distribution observed in locust hopper bands.

This talk is suitable for undergraduate students.