MARK LEWIS, University of Alberta
The mathematics behind biological invasion processes

Models for invasions track the front of an expanding wave of population density. They take the form of parabolic partial differential equations and related integral formulations. These models can be used to address questions ranging from the rate of spread of introduced invaders and diseases to the ability of vegetation to shift in response to climate change.

In this talk I will focus on scientific questions that have led to new mathematics and on mathematics that have led to new biological insights. I will investigate the mathematical and empirical basis for multispecies invasions, for accelerating invasion waves, and for nonlinear stochastic interactions that can determine spread rates.