CHUNHUA OU, York University
Modelling spatio-temporal patterns in epidemiology

In this talk we present a case study on the spread of rabies in Europe. We will explain how to apply the non-local parabolic model to study the infectious disease in a concrete example. A new mathematical model with non-local response on the spread of "rabies" in Europe will be presented. First we consider our model in a finite domain with Neumann boundary condition. Asymptotic stability of the equilibriums is given. When the spatial domain becomes the whole real line, traveling wave fronts are investigated. The spreading speed is determined by the standard stability analysis and the minimal speed is confirmed by numerical computation. Rigorous proof of the existence of traveling fronts is presented when the wave speed is large.