Speaker: Peter Hinow

Title: Size-structured populations with distributed states at birth

Abstract: Age-structured models based on first order hyperbolic partial differential equations have been employed successfully in population dynamics for a long time and are considerably well understood. In contrast to such models where every individual is born at the same age 0, size-structured models allow to take into account different, distributed birth sizes. "Size" here can be a quite general concept, for example mass, energy content or pathogen load in a disease model. This introduces a birth operator that takes values in an infinite-dimensional Banach space and complicates greatly the mathematical analysis. In this survey, we will describe some examples of models that we recently investigated in a series of joint papers with Jozsef Farkas (University of Stirling, United Kingdom). The emphasis will be on questions such as asymptotic growth for linear models and the existence and stability of steady states for nonlinear models.