1125-92-2150 **Azmy S. Ackleh** (ackleh@louisiana.edu), **Baoling Ma*** (baoling.ma@millersville.edu) and **Robert Miller** (robert@fenstermaker.com). *Finite Difference Approximations for a General Nonlinear Model for the Interaction of Structured Populations and the Environment.*

In this talk, I will present a general model for the interaction of a size-structured population with its environment. The vital rates of the individuals are assumed to depend on a number of variables including the total population and the environmental factors. Finite difference approximations for this general model has been developed. The convergence of the numerical method to the unique weak solution of the nonlinear system of partial differential equations coupled with ordinary differential equations has been proved. At the end some potential applications of this general model will be provided in various fields ranging from blood cell population dynamics to the study of invasive species. (Received September 19, 2016)