California State University, Long Beach

THE MATHEMATICS COLLOQUIUM

presents

Barbara A. Bailey

San Diego State University

speaking on

A Statistical Approach to Modeling Nonlinear Systems

Friday, March 16, 2007 **12:00PM-1:00PM**

FO3-200A

Abstract: Many environmental processes evolve over space and time creating a complex dynamical system. The construction of nonlinear regression models that describe the evolution of complex processes will be useful in many applications. Statistical modeling of dynamical systems makes the estimation and construction of confidence intervals for interesting quantities from data possible. When noise is an integral part of the system's dynamics, a nonlinear time series approach can be used to quantify the dynamics and predictability of the system. This involves fitting nonlinear models and estimating dynamical systems quantities of interest such as global and local Lyapunov exponents, along with measures of uncertainty for these estimates. Dynamical Systems of interest will include the evolution of cloud cover over time and its space-time relationship to other climate variables, simple biogeochemical model of plankton dynamics, and abundance of Calanus finmarchicus from hydrographic data.