

# Mathematics Colloquium



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Friday, October 24<sup>th</sup>

4:00pm

PS 308

## A Dynamical Systems Approach to Time Series Analysis

Abstract

Time series analysis has traditionally been applied in fields such as physics, engineering, finance, and economics. As a result, most of the classical time series literature has been written by and for practitioners in these fields. Over the past several decades, improvements in data collection technology and implementation of long-term monitoring programs have greatly increased the need for time series analysis in ecology and other biological and environmental sciences. However, most textbooks on time series analysis are not aimed at this audience, and there is a substantial gap between the quantitative preparation of most biological scientists and the mathematics, language, and notation of classical time series literature. Based on my experience in working with and training graduate students and researchers in the biological sciences, I have found that dynamical systems, which are familiar to most biological scientists, can help bridge this gap. In this talk, I will show how basic ARIMA time series models can be viewed as stochastic versions of discrete dynamical systems. I will conclude with an example of a nonlinear model fit to fish population data.

For Colloquium attendees, refreshments available in PS 317 at 3:30