

**MICHIGAN STATE UNIVERSITY**  
Department of Statistics and Probability

## COLLOQUIUM

**Robert Lund**  
Clemson University

# Stationary Count Time Series with Specified Marginal Distribution

Thursday, February 19, 2015  
10:20 a.m. - 11:10 am  
Refreshments 10:00 am  
C405 Wells Hall

### **Abstract**

This talk overviews stationary integer-valued (count) time series models, proposing some new but simple techniques for modeling count series.

Previous work has focused on thinning methods and classical time series autoregressive moving-average (ARMA) difference equations; in contrast, our methods bypass ARMA tactics altogether by using a stationary renewal process to generate a correlated sequence of Bernoulli trials. By superpositioning independent copies of Bernoulli processes, stationary series with binomial, Poisson, geometric, or any other discrete marginal distribution are easily constructed. The model class is naturally parsimonious, can have positive or negative autocorrelations, and can be fitted via one-step-ahead linear prediction techniques for stationary series. A time series model with binomial marginal distributions is fitted to observed counts of wet days in consecutive weeks at Key West, Florida; a bivariate model for major hurricanes in the Pacific and Atlantic Basins with long memory and negative correlations is developed assuming Poisson marginal distributions.

*To request an interpreter or other accommodations for people with disabilities, please call the Department of Statistics and Probability at 517-355-9589.*