Distinguished Professor Noel Cressie

Title: **Sixty-year climate-change projections over North America**

Abstract:
Climate models have become the primary means for scientists to project future climate change and to understand its potential impact. In this talk, temporally averaged seasonal surface-temperature fields for the current (1971-2000) and future (2041-2070) periods, produced from two regional climate models (RCMs) and driven by the same atmosphere-ocean general circulation model (GCM) in the North American Regional Climate Change Assessment Program (NARCCAP) Phase II experiment, are considered. A two-way spatial analysis of variance (ANOVA) model with the factor of season, the factor of RCM, and their interaction, is set up to analyse the projected climate change, here the difference between future and current temperatures. The main effects and interactions are assumed to follow Spatial Random Effects (SRE) models; hence, the computations associated with this spatial ANOVA of high-resolution RCM outputs can be carried out without having to resort to approximations, and a flexible class of spatial covariance functions is allowed. We conclude that projected temperatures in North America are credibly higher, and that the associated warming effects differ in spatial areas and in seasons but differ little between RCMs. This research is joint with Emily Kang, University of Cincinnati.