

## **Joint ECE and CS Seminar**

**Time and Location:** Mon. Apr. 7, 2014 at 11am in CSB130

**Speaker:** Imme Ebert-Uphoff, Research Faculty,  
Department of Electrical and Computer Engineering,  
Colorado State University

**Title:** Learning about our planet's climate through structure learning of Bayesian networks

**Abstract:** This talk discusses a new application of machine learning in climate science, namely learning "graphs of information flow". The key idea is to interpret large-scale atmospheric dynamical processes as information flow round the globe and to identify their pathways from observed data using causal discovery algorithms.

We use constraint-based structure learning of dynamic Bayesian networks for the causal discovery process, i.e. to learn the graphs of information flow. The resulting graphs allow climate scientists to gain new insights, for example to identify subtle changes of the planet's dynamics or to evaluate climate models. We will introduce the basic method, discuss obstacles encountered and overcome, and present the first insights gained into earth's climate.